





4<sup>0</sup> Brit. 85 Km



CONTRIBUTIONS

VITAL STATISTICS.







CONTRIBUTIONS  
TO  
VITAL STATISTICS.

R. E. NELSON, F.R.S.

THIRD EDITION

LONDON

JOHN BARNES, 11, BEDFORD SQUARE, W.

1891

1891



CONTRIBUTIONS

LETTER STATISTICS

AN INVESTIGATION OF THE RATE OF MORTALITY AND THE CAUSE

OF DEATH

FROM ORIGINAL AND CORROBORATED DATA

CONTRIBUTIONS

IN INVESTIGATION INTO THE CAUSE OF DEATH AND THE CAUSE OF MORTALITY

FROM ORIGINAL AND CORROBORATED DATA

LETTER STATISTICS

LETTER STATISTICS

AN INVESTIGATION INTO THE CAUSE OF DEATH AND THE CAUSE OF MORTALITY

OF DEATH

LETTER STATISTICS

LETTER STATISTICS

LONDON:

JOHN BARNARD & CO.



# CONTRIBUTIONS

TO

## VITAL STATISTICS:

BEING,

A DEVELOPMENT OF THE RATE OF MORTALITY AND THE LAWS  
OF SICKNESS,

FROM ORIGINAL AND EXTENSIVE DATA;

WITH

AN INQUIRY INTO THE INFLUENCE OF LOCALITY, OCCUPATIONS, AND  
HABITS OF LIFE ON HEALTH;

AN

ANALYTICAL VIEW OF RAILWAY ACCIDENTS;

AND

AN INVESTIGATION INTO THE PROGRESS OF CRIME IN ENGLAND  
AND WALES.

BY

F. G. P. NEISON, F.L.S. &c.

~~~~~  
THIRD EDITION.  
~~~~~

*Neison  
Contributions  
to vital statistics*

London:

SIMPKIN, MARSHALL, & Co.

—  
MDCCCLVII.

715



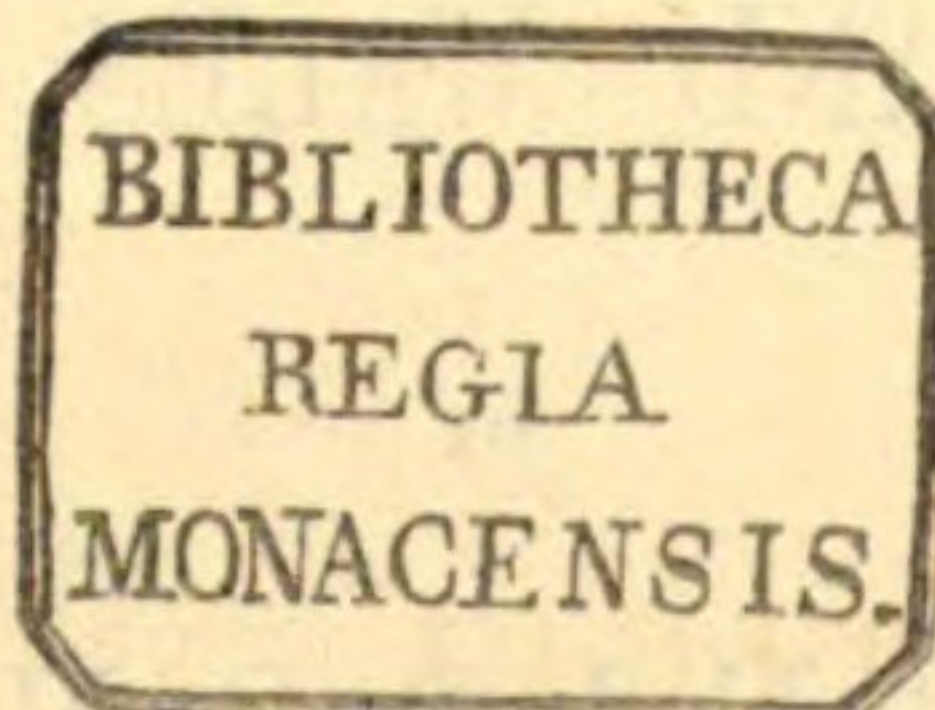
CONTRIBUTIONS

VITAL STATISTICS

OF THE CITY OF LONDON  
FOR THE YEAR 1851  
AS DERIVED FROM THE  
REGISTERS OF THE  
CITY OF LONDON

WESTMINSTER:

PRINTED BY THOMAS BRETTILL, RUPERT STREET, HAYMARKET.





Dedicated

TO

COLONEL WILLIAM HENRY SYKES, F.R.S. &c. &c.

CHAIRMAN OF THE HONOURABLE THE COURT OF DIRECTORS

OF

THE EAST INDIA COMPANY,

In Testimony

OF

HIS MANY VALUABLE CONTRIBUTIONS

TO

STATISTICAL SCIENCE.



Q121116

PROPOSED WILLIAM HENRY SMITH, F.R.S.

THE SECRETARY OF THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS

THE SOCIETY OF AMERICAN HISTORIANS



## P R E F A C E.

---

IN the present edition of this work will be found a very large amount of new matter, most of which it is believed is calculated to throw considerable light on questions of importance, which have been engaging the public mind for several years. The greater part of pp. 1-101 is nearly the same in form with that of the first and second editions, while the matter in pp. 102-407, and pp. 531-606 did not appear in the earlier editions. A large portion of pp. 408-530 appeared in the first and second editions, and also in the thirteenth edition of "Observations on Odd Fellow and Friendly Societies," which is now out of print; but even a perusal of these pages will shew that they contain a great amount of entirely new data, having not only an important bearing on Friendly and Provident Societies, but on questions of serious importance in public Hygiene, and to which attention will be immediately directed.

The data from which has been deduced the expression for the general mortality of England and Wales, and which is used as a standard for the comparison of the results for sectional classes of the community, will be found in a condensed shape in Table B, page 4.

Throughout the whole of the three first papers, embraced in pp. 1-101, and more particularly in the Letter to the Registrar-General, given in pp. 13-15, the conditions under which sanitary investigations should be conducted are very fully discussed; and it is greatly to be regretted that the precautions pointed out are not more generally attended to in all such inquiries. It is perhaps impossible to point to any other investigations connected with the governmental departments of the country, in which less skill, judgment, and tact, have been evinced than in those bearing on the sanitary state of our large towns and cities; and hence the most unsatisfactory results of the vast amount of labour and enormous expenditure of money, particularly within the last dozen of years, without any improvement in the health of the population being effected. That the methods of investigation followed by those entrusted with the conduct of the sanitary



movement would be followed by no satisfactory result, was clearly foretold in the first edition of this work, published in 1845; and the same errors of method were also subsequently alluded to in the Reports of the Registrar-General himself; but not with that fulness, force, and urgency by which, from his important position and authority, no doubt, a powerful impression would have been made on the country, and thence on the departments entrusted with the regulation of sanitary measures. Relying on the evidence to be derived from the Returns of the Registrar-General, it would appear that the health of the country, instead of improving, is actually gradually deteriorating, and particularly so since the time the Sanitary Commissioners commenced to stir most actively in the health of towns. This fact is most strikingly exhibited by the following figures derived from the Returns of the Registrar-General.

The results in the second column of each section of the following Abstract exhibits the rate of mortality for males in England and Wales during the seven years 1838-44, and are derived from page 177 of the Registrar-General's ninth Report; and those in the third column are the corresponding results for the ten years 1845-54, and are taken from page xvi of his seventeenth Report.

The same figures will likewise be found in page 87 of the Appendix to the seventeenth Report. The last column of each section shews the excess of mortality per cent. in the more recent period of years.

*Rate of Mortality per Cent. per Annum in England and Wales during the Seven Years 1838-44, and the Ten Years 1845-54.*

| Ages.           | MALES.         |                |                                         | FEMALES.       |                |                                         | Ages.           |
|-----------------|----------------|----------------|-----------------------------------------|----------------|----------------|-----------------------------------------|-----------------|
|                 | 1838-44<br>(a) | 1845-54<br>(b) | Excess per<br>Cent. of<br>(b) over (a). | 1838-44<br>(a) | 1845-54<br>(b) | Excess per<br>Cent. of<br>(b) over (a). |                 |
| 0 to 4          | 7.072          | 7.356          | 4.016                                   | 6.037          | 6.343          | 5.069                                   | 0 to 4          |
| 5 ... 9         | .926           | .916           | - 1.080                                 | .900           | .895           | - 0.556                                 | 5 ... 9         |
| 10 ... 14       | .504           | .523           | 3.770                                   | .548           | .546           | - 0.365                                 | 10 ... 14       |
| 15 ... 24       | .805           | .833           | 3.478                                   | .833           | .863           | 3.601                                   | 15 ... 24       |
| 25 ... 34       | .968           | 1.015          | 4.855                                   | 1.009          | 1.083          | 7.334                                   | 25 ... 34       |
| 35 ... 44       | 1.249          | 1.309          | 4.884                                   | 1.242          | 1.293          | 4.106                                   | 35 ... 44       |
| 45 ... 54       | 1.776          | 1.895          | 6.700                                   | 1.548          | 1.617          | 4.458                                   | 45 ... 54       |
| 55 ... 64       | 3.141          | 3.226          | 2.706                                   | 2.782          | 2.855          | 2.624                                   | 55 ... 64       |
| 65 ... 74       | 6.613          | 6.755          | 2.147                                   | 5.885          | 6.104          | 3.721                                   | 65 ... 74       |
| 75 ... 84       | 14.394         | 14.991         | 4.147                                   | 13.201         | 13.652         | 3.416                                   | 75 ... 84       |
| 85 ... 94       | 29.646         | 30.294         | 2.186                                   | 27.553         | 28.076         | 1.898                                   | 85 ... 94       |
| 95 and upwards. | 42.697         | 45.219         | 5.906                                   | 40.795         | 45.226         | 10.861                                  | 95 and upwards. |
| All Ages.       | 2.270          | 2.364          | 4.141                                   | 2.104          | 2.205          | 4.800                                   | All Ages.       |



It will be thus seen, that during the ten years 1845-54, the mortality for the male sex exceeds that for the seven years immediately preceding, by no less than 4.141 per cent.; and the excess for the female sex during the same period is as much as 4.800 per cent. These are results for which those who sanctioned the various sanitary movements which have agitated the country during the last thirteen or fourteen years were certainly not prepared, and it must be confessed that if the causes which influence the mortality taking place amongst the population of this country are within the control of the various Commissions and Boards which have, from time to time, been appointed for the superintendence of health, there must have been existing, during the last ten years, some unhappy combination of circumstances, which has not only neutralised the intended effect of any measures which have been carried out, but has added from four to five per cent. to the general rate of mortality which prevailed during the preceding seven years. It is of course not to be supposed that sanitary measures can be instantly carried out, and their effects immediately seen; but the period embraced in the preceding illustration is an extended one, and it would almost appear that, with the advance of time, the greater has been the rate of mortality amongst the population. It may be said that the period of ten years, in which this excessive mortality has taken place, embraces the epidemical years 1849 and 1854, in which cholera and diarrhœa raged so triumphantly; but even assuming that such epidemics are entirely beyond the reach of sanitary measures, and excluding those two years from the comparison, the remaining eight years of the period would still exhibit an excess of mortality of 2.511 per cent. for males, and of 2.947 for females. The following will afford a ready means of forming an opinion on this question:—

*Mortality per Cent. amongst Males at various ages in each of the Seventeen Years, 1838-54.*

| Ages.          | 1838.  | 1839.  | 1840.  | 1841.  | 1842.  | 1843.  | 1844.  | 1845.  | 1856.  | 1847.  | 1848.  | 1849.  | 1850.  | 1851.  | 1852.  | 1853.  | 1854.  | Ages.          |
|----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------------|
| 0 to 4         | 7.041  | 7.167  | 7.542  | 6.843  | 7.048  | 6.898  | 6.984  | 6.665  | 7.760  | 7.588  | 7.401  | 7.513  | 6.695  | 7.298  | 7.500  | 7.346  | 7.795  | 0 to 4         |
| 5 .. 9         | .901   | .904   | 1.083  | .956   | .901   | .844   | .897   | .823   | .825   | .970   | 1.043  | 1.124  | .814   | .869   | .906   | .847   | .935   | 5 .. 9         |
| 10 .. 14       | .519   | .512   | .542   | .510   | .501   | .478   | .473   | .466   | .507   | .550   | .530   | .646   | .467   | .491   | .520   | .506   | .550   | 10 .. 14       |
| 15 .. 24       | .851   | .819   | .832   | .811   | .783   | .772   | .763   | .781   | .859   | .929   | .858   | .951   | .717   | .776   | .799   | .828   | .835   | 15 .. 24       |
| 25 .. 34       | 1.064  | .986   | .995   | .978   | .928   | .924   | .940   | .926   | 1.025  | 1.100  | 1.026  | 1.243  | .879   | .948   | .968   | 1.013  | 1.025  | 25 .. 34       |
| 35 .. 44       | 1.342  | 1.255  | 1.266  | 1.217  | 1.197  | 1.218  | 1.225  | 1.202  | 1.272  | 1.436  | 1.303  | 1.581  | 1.165  | 1.236  | 1.230  | 1.316  | 1.349  | 35 .. 44       |
| 45 .. 54       | 1.949  | 1.978  | 1.796  | 1.785  | 1.733  | 1.722  | 1.750  | 1.715  | 1.800  | 2.065  | 1.864  | 2.262  | 1.716  | 1.787  | 1.816  | 1.958  | 1.962  | 45 .. 54       |
| 55 .. 64       | 3.410  | 3.192  | 3.142  | 3.137  | 3.041  | 3.008  | 3.051  | 2.975  | 3.129  | 3.649  | 3.266  | 3.655  | 2.980  | 3.031  | 3.073  | 3.278  | 3.227  | 55 .. 64       |
| 65 .. 74       | 6.916  | 6.421  | 6.678  | 6.482  | 6.595  | 6.578  | 6.736  | 6.491  | 6.758  | 7.696  | 6.793  | 7.244  | 6.306  | 6.396  | 6.284  | 6.912  | 6.665  | 65 .. 74       |
| 75 .. 84       | 14.752 | 13.874 | 14.488 | 14.266 | 14.578 | 14.090 | 14.651 | 14.400 | 15.070 | 17.326 | 14.986 | 15.187 | 14.019 | 14.055 | 14.161 | 15.897 | 14.808 | 75 .. 84       |
| 85 .. 94       | 29.745 | 27.923 | 30.242 | 29.650 | 29.438 | 28.758 | 31.716 | 30.191 | 32.214 | 35.553 | 30.622 | 29.976 | 28.555 | 28.245 | 28.279 | 31.297 | 28.003 | 85 .. 94       |
| 95 and upwards | 49.699 | 43.112 | 48.498 | 46.633 | 46.427 | 45.681 | 43.228 | 49.035 | 51.651 | 56.607 | 42.435 | 42.859 | 38.560 | 41.937 | 43.422 | 47.305 | 38.382 | 95 and upwards |
| All Ages.      | 2.335  | 2.275  | 2.372  | 2.238  | 2.241  | 2.202  | 2.242  | 2.170  | 2.395  | 2.546  | 2.391  | 2.581  | 2.143  | 2.276  | 2.320  | 2.379  | 2.434  | All Ages.      |



It is thus evident that in the more recent years there is a general tendency to increased mortality amongst males; and like results will be observed in the following Abstract for female lives:—

*Mortality per Cent. amongst Females at various ages in each of the Seventeen Years, 1838–54.*

| Ages.           | 1838.  | 1839.  | 1840.  | 1841.  | 1842.  | 1843.  | 1844.  | 1845.  | 1846.  | 1847.  | 1848.  | 1849.  | 1850.  | 1851.  | 1852.  | 1853.  | 1854.  | Ages.           |
|-----------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------------|
| 0 to 4          | 6.047  | 6.138  | 6.432  | 5.861  | 6.023  | 5.897  | 5.885  | 5.657  | 6.675  | 6.553  | 6.396  | 6.488  | 5.738  | 6.299  | 6.445  | 6.362  | 6.814  | 0 to 4          |
| 5 .. 9          | .895   | .935   | 1.113  | .963   | .925   | .848   | .902   | .800   | .813   | .951   | .997   | 1.102  | .810   | .860   | .878   | .813   | .924   | 5 .. 9          |
| 10 .. 14        | .543   | .535   | .569   | .520   | .512   | .485   | .503   | .476   | .533   | .577   | .566   | .653   | .491   | .527   | .537   | .540   | .560   | 10 .. 14        |
| 15 .. 24        | .854   | .848   | .868   | .842   | .830   | .784   | .810   | .815   | .870   | .919   | .878   | 1.000  | .777   | .818   | .834   | .861   | .859   | 15 .. 24        |
| 25 .. 34        | 1.046  | 1.007  | 1.033  | 1.007  | 1.005  | .976   | 1.006  | .980   | 1.048  | 1.173  | 1.090  | 1.347  | .988   | 1.005  | 1.031  | 1.064  | 1.102  | 25 .. 34        |
| 35 .. 44        | 1.313  | 1.248  | 1.269  | 1.227  | 1.220  | 1.227  | 1.200  | 1.188  | 1.242  | 1.422  | 1.301  | 1.617  | 1.169  | 1.193  | 1.214  | 1.251  | 1.328  | 35 .. 44        |
| 45 .. 54        | 1.660  | 1.549  | 1.567  | 1.542  | 1.526  | 1.484  | 1.525  | 1.467  | 1.559  | 1.789  | 1.589  | 1.998  | 1.473  | 1.519  | 1.514  | 1.596  | 1.663  | 45 .. 54        |
| 55 .. 64        | 2.977  | 2.730  | 2.829  | 2.740  | 2.744  | 2.692  | 2.773  | 2.668  | 2.783  | 3.226  | 2.860  | 3.355  | 2.625  | 2.679  | 2.660  | 2.845  | 2.852  | 55 .. 64        |
| 65 .. 74        | 5.919  | 5.554  | 5.899  | 5.841  | 6.013  | 5.877  | 6.052  | 5.856  | 6.156  | 6.964  | 6.072  | 6.596  | 5.717  | 5.854  | 5.708  | 6.133  | 5.979  | 65 .. 74        |
| 75 .. 84        | 13.281 | 12.519 | 13.541 | 13.375 | 13.084 | 13.037 | 13.494 | 13.036 | 13.794 | 15.945 | 13.604 | 14.028 | 12.684 | 12.818 | 13.177 | 14.106 | 13.325 | 75 .. 84        |
| 85 .. 94        | 26.463 | 25.242 | 28.394 | 28.255 | 28.438 | 27.655 | 28.434 | 27.569 | 30.350 | 32.104 | 27.623 | 28.028 | 25.922 | 26.357 | 27.427 | 28.968 | 26.412 | 85 .. 94        |
| 95 and upwards. | 41.099 | 39.915 | 46.199 | 45.907 | 42.832 | 46.679 | 44.616 | 42.036 | 52.200 | 53.230 | 46.816 | 43.323 | 42.927 | 45.017 | 40.676 | 45.770 | 40.268 | 95 and upwards. |
| All Ages.       | 2.133  | 2.090  | 2.203  | 2.083  | 2.098  | 2.047  | 2.083  | 2.012  | 2.221  | 2.380  | 2.224  | 2.445  | 2.013  | 2.124  | 2.156  | 2.201  | 2.273  | All Ages.       |

Whatever opinions may be entertained on the merits of the methods now being employed for the improvement of the health of towns, there can be no doubt that, so far as the returns of the Registrar-General afford the means of judging, the rate of mortality has been considerably increased in recent years. It is much to be regretted that the Registrar-General should not, in his Annual Reports, enter on a full discussion of this question, and endeavour to shew, from the ample body of facts in his possession, the changes which are from time to time taking place coincident with the presumed improvements introduced under the superintendence of the Board of Health, in the different districts of the kingdom. Certainly one of the main objects contemplated by the Registration Act is to pronounce, from time to time, upon the changes in the rates of mortality in different districts, and the causes to which they are due. Perhaps no other documents issued under the auspices of the Government are so pregnant with curious, and in many instances, important speculations; but the great problem as to the effect which the sanitary measures of the last dozen of years has had on the public health has been all but overlooked by him. The districts and sub-districts under the Registration Act enable him to determine, from year to year, with great nicety, the differences of mortality taking place within very limited localities; and as these districts can always with much precision, be connected with those in which the various measures are carried out by the inspectors and other officers of health, it is not too much to expect some distinct



information in regard to the actual influence those measures may have had on the mortality of the districts in which they have been in operation. With anything short of this, the public should not be satisfied. The Sanitary Commission is a most expensive one, and the country should be informed of the advantages derived from so great an outlay. Twelve years ago, a vast effort was made by an influential sanitary reformer, to shew that certain conditions, peculiar to some Metropolitan districts, produced the most wonderful destruction of human life as compared with the results of other districts; but it was subsequently found that the same data which led him to these conclusions did, when properly treated, prove the very opposite state of things to be the fact, and hence the caution needed in all such inquiries. As already stated, the Registrar-General has, in one of his Reports, noticed the fallacious methods of inquiry employed in the Health of Towns' Reports in question; but he is called on to go much further, for by virtue of his office he should interrogate the influence of all the measures carried out for promoting the public health, and should set forth in his Reports how far they have been successful or otherwise. Not only has the Parliament, but the people of this country, a right to the most ample and conclusive information on this subject.

The Registrar-General has for the first time in his Fourteenth Report attempted to throw some light on the influence of particular employments and occupations on health. The necessity of an inquiry into this question was pointed out to him in my letter of the 22nd March, 1845, see pp. 13-15 *seq.*, but while engaged in the preparation of that Report, he does not appear to have been aware of the remarkable illustrations of the influence of employments on health given in the previous editions of this work, as well as in the publication by Mr. Ratcliffe in the year 1850. It may also be here pointed out, that data derived from the sources from which the results in the following pages are deduced, as well as those appearing in Mr. Ratcliff's Analysis, are free from some objections to which the Registrar-General's Returns are unavoidably subject. Any one who is well acquainted with the condition and habits of the working classes must know how much more than usual those following some particular occupations are addicted to drinking and intoxicating habits, and therefore in viewing the general mortality of those particular employments, there is seen not only the mortality due to that branch of industry, but also the augmented ratio arising from indulgence in the too general habits of dissipation. The data collected from the records of Friendly Societies are however almost entirely free from such objections, for it is well understood that the working men who enter Benefit Societies and subsequently fall into irregular habits, soon after cease membership from inability to continue their periodical contributions to the club, and hence results deduced from observations made on those who maintain membership may be regarded as fairly indicating the relative degree of mortality to which those following various occupations are subject. In the following contributions a large amount of data is given not only on



that subject, but also on the ratio of sickness characteristic of different employments. From the observations contained in pp. 12-16, it will be seen that until the period of the next census in 1861, little reliance can be placed on the deductions made in the Reports of the Registrar-General in regard to the sanitary condition of different occupations. In page xxii of his Fourteenth Report he remarks that "the extraordinary mortality of butchers appears to have escaped observation," but on referring to page 94 of the first edition of this work, or page 411 *seq.*, it will be found to be distinctly pointed out that they experience a very high rate of mortality although not subject to above the average amount of sickness.

The Appendix to the Eighth Report of the Registrar-General contains a document of the highest value in throwing light on a question but indifferently understood at present, even by those giving much attention to vital statistics, namely, the great prolongation usually supposed to have taken place in the duration of life in this country within the last hundred or one hundred and fifty years.

The history of the progress of early inquiries made into the rate of mortality in different classes is too obscure to throw much light on this question, and it may therefore be sufficient to commence our observations on it from the period when the most active and successful efforts were made to impress on society the importance of having strict regard to well ascertained laws of mortality, in pecuniary transactions on life.

The honour of this great achievement in human knowledge belongs to the celebrated Dr. Price, and to the effect of his writings is mainly traceable the origin of the opinion, that in recent years the duration of life is much prolonged. The well-known Table of Mortality, usually, though erroneously, called the Northampton Table, and which is based on facts relating to the middle of the last century, exhibits a certain duration of life, and, for a long time, this Table continued to have undivided sway and authority in the estimation of writers and those engaged in assurance transactions, as indicating a near approximation to the rates of mortality among certain classes of the community.

At last, however, the late Mr. Milne brought under public attention the Table of Mortality, known as the Carlisle Table, and although the data embodied in it had reference to a period not much subsequent to the time to which the Northampton Table relates, still, from its more recent promulgation, the impression produced on the public mind was that which would naturally arise from other scientific writings, that each table represented the state of the science at a period near to the date of its first appearance.

The remarkably increased duration of life shewn by the Carlisle over the Northampton Table could not fail to arrest public attention, and the elaborate and able work in which Mr. Milne had issued his Table into the world claimed for it an importance and consideration not before conceded to even the labours of Dr. Price himself.



An examination of the writings of this period will at once satisfy any inquirer, that, a very short time after the appearance of Mr. Milne's work, the Carlisle Table began to grow in favour and public estimation, and hence, owing to the misconception that its recent appearance was evidence also of the recent origin of its data, and, owing to the increased duration of life deducible therefrom, an opinion prevailed that, since the appearance of Dr. Price's writings, an improvement had taken place in the public health. This impression has continued to gain ground until the present hour. It is consequently important to test the correctness of this opinion, not only from its bearings on legislative proceedings, but also from the remarkable hold which both classes of results have taken of the assurance interests of this country as well as of those on the Continent.

At first glance it must be evident that, from the almost cotemporaneous but remote origin of the data of both Tables, the observable difference in their rates of mortality could not be held to shew any improvement in the duration of life within recent periods ; besides, if a difference really does exist in their rates of mortality, that difference can be supposed to be only due to the local circumstances and influences peculiar to the small districts from which the data were collected, and, however true the results may be considered in regard to the district so represented by the data, it is impossible, from their evidence alone, to regard either as a type of the rate of mortality prevailing, at a former or the present period, among either the assurance classes, here or elsewhere, or as affording any evidence of the rate of mortality in the country generally, or in individual classes of the population.

Having said this much on the influence which the Northampton Table has exercised on the public mind, it is a very curious if not a mortifying circumstance to discover, at this advanced stage of our progress, that the gigantic monied interests of our greatest companies have long relied, almost exclusively, on a Table which has been falsely constructed, and which, in fact, does not represent the rate of mortality, even in the locality from which the data have been collected, nor, as will hereafter appear, the rate of mortality in the country generally, nor among the assured portion of the community.

As already stated, the Appendix to the Eighth Report of the Registrar-General contains one of the most valuable and interesting papers ever published in connection with the Northampton Table. Not only in an historical point of view, but also on account of its practical applications, the paper is one of first importance to life offices. To the author, Dr. Farr, the assurance interests of this country must be considered deeply indebted.

At the period when Dr. Price constructed the celebrated Northampton Table he did not possess all the elements necessary to determine correctly the rate of mortality in the locality under investigation, and, to supply the defective element, he had recourse to an hypothesis which recent inquiries have proved to be erroneous.



This should not be considered in the light of a reflection on Dr. Price, for there is reason to believe that, with the imperfect materials at his command, it would have been difficult to have followed a better plan than that which he adopted; but still Dr. Farr has been enabled to advance historical evidence to shew that the hypothesis was a fallacious one, and that, consequently, the rate of mortality deduced therefrom is also erroneous.

From the deaths which have taken place in "All Saints" parish, Northampton, during the seven years, 1838-44, being the same district to which Dr. Price's facts relate, Dr. Farr has constructed a Table of Mortality, on the plan adopted by Dr. Price in the construction of his Table for the forty-six years, 1735-80, and, although an interval of sixty years has elapsed between the periods to which each class of facts belong, still it is curious to find that little or no change has taken place in the rate of mortality, and the one Table might be used for the other.

It is however important to understand that the method followed by Dr. Price in the construction of his Table is now admitted by all authorities to be wrong, and any one who, at this time, would venture upon a similar course must necessarily sacrifice all public esteem for scientific accuracy.

The parallel Table by Dr. Farr has been purposely constructed on the same plan, and the results of both agree so closely that it is impossible for any one to argue therefrom, that since the middle of last century any improvement whatever has taken place in the duration of life in Northampton.

Dr. Farr has, however, not stopped at this stage of the inquiry, but has gone further. He has formed a Table on true principles from the data referred to, for the seven years 1838-44, and the results arrived at do not differ widely from the rate of mortality shewn in Mr. Milne's Carlisle Table and other Tables still more recently promulgated.

If, therefore, the facts treated by Dr. Farr on true principles shew so great an improvement in life, there is every reason to believe that the materials with which Dr. Price had to deal would also have shewn similar results had they been properly treated, and consequently, so far as the Northampton and Carlisle Tables are concerned, there is no reason to believe that any augmentation has taken place in the duration of life during the last hundred years.

The Northampton and Carlisle Tables have been dwelt on from the importance they have assumed in the practice of life offices.

There are, however, other local Tables, as the Chester and others, to which reference might be made if necessary. Proofs of the like stability in the rate of mortality may also be derived from observations of large masses of mankind.

The mortuary registers of Sweden, in a very complete form, go as far back as the



year 1751, and up to the present time no improvement appears to have taken place in the duration of life. The result for that kingdom for the last hundred years do not appear to differ much from the rate of mortality in this country during the last fifteen years.

Again, in France, if the Tables of Demonferrond are to be relied on, the value of life there does not differ in any material degree from that indicated by either of the other classes of results.

It is, however, right to remark that the French people, although so much advanced in scientific knowledge and civilisation, are still indifferent to the advantages of a proper census of the people, and M. Demonferrond has been compelled, owing to the ages of the population being unknown, to resort to an expedient in the construction of his Table which, although generally unsafe, may in his particular instance probably not affect the value of the results in any serious degree.

Life offices in this country have had their transactions almost exclusively with the middle and upper classes, and the same remark is to a great extent applicable to the experience of companies on the Continent and in America; therefore whatever value may be attached to any of the mortality Tables hitherto referred to, they cannot, in the absence of other evidence, be considered as strictly applicable to the purposes of assurance companies.

The public is indebted to the elder Mr. Finlaison for what is called the Government Tables; but these, irrespective of inherent evidence of anomalous conditions, could scarcely be thought applicable to the purposes of a life office: for as the bulk of the data has reference to a remote period of years, if any value is to be attached to prevailing opinions on the recent improvement of life, the data must be wholly inapplicable to the present time.

It may also be here remarked that, as pointed out in page 42 *seq.*, that those usually quoted as the Government Tables are not those based on the corrected and revised data of 1829; but the Tables given in the Reports of 1824, and that which the public really speak of as being the Government Table, is not in fact the one finally adopted. We have, however, Tables derived directly from the experience of life offices,—the Equitable and Amicable Societies,—but the bulk of the facts of both Tables relates to remote years, and therefore if any importance is to be attached to the recent improvement in life they are clearly not applicable to the present operations of assurance companies.

There is likewise the Table usually denominated the "Experience Table," deduced from the recorded observations of fifteen life offices, in addition to those of the Equitable and Amicable Societies already mentioned, reported on by the committee of actuaries appointed in the year 1839. In these observations, like those deduced from the Amicable and Equitable Life Offices, the principal portion of the data has no reference to recent years; but there is a much more serious objection to be brought against the results given



in the "Experience Table." From the indisposition evinced by the contributing offices to let their individual experience be known, even to the members of the committee to whom the inquiry was entrusted, it became necessary that the different schedules should be submitted in an anonymous form: all were given with blank headings, and so completely mixed up together that it was impossible afterwards to determine from what office any particular schedule came.

This arrangement prevented the investigation being any other than one confined to policies issued by those offices, and not an estimate of the mortality among a certain number of lives.

To those, therefore, of even limited experience, it must be obvious that the results are thereby deprived of all value as indicating the rate of mortality among the offices contributing the facts.

Nothing is more notorious than the frequency with which the same life is assured in duplicate and triplicate, not only in the same office but in several offices, and it often happens that on the same life there has at one time or another been issued, as many as from twenty to fifty policies in the different offices conjointly. To take an extreme example, in order to shew the nature of the principle and its effect in vitiating the truth of any results derived from a calculation founded on the number of policies, and not upon the number of lives.

It is well known, in most of the assurance offices, that a distinguished personage was so fully assured in the life offices in this kingdom that it was impossible to obtain any further policies on his life from assurance companies, and it has been said that recourse was had to Lloyds to have the life underwritten there. The policies existing upon this life, at one time, it has been considered could not be less than three or four hundred. It is hence evident that a death taking place under such circumstances would, in the result of such inquiry, appear as three or four hundred deaths, while in fact only one had happened.

In like manner, the fact of the life still surviving would produce the anomalous result of there being 1000 or 2000 years of risk depending upon the duration of these policies without any recorded death.

It is therefore clear, that unless the principle of repeated policies on the same life was uniform as to numbers, and very generally characteristic of all the assurances effected, that compensation errors could not be expected to take place sufficient to render the results even a near approximation to the truth.

So far, therefore, we are yet without any satisfactory data, derived directly from the life offices of this country, which can be relied on as indicating the rate of mortality among the assured classes in recent years.

On the Continent, however, we have been furnished with the experience of the



Gotha Life Office, and in this instance the results are free from the objections just alluded to, as the investigation has been conducted on the number of lives, and not on the number of policies. The experience of the Gotha Life Office, as given in pp. 151–200, shews a remarkable and peculiar feature in the state of mortality to which the members are subject. At the younger ages, the mortality is much less than that indicated by any of the other Tables yet alluded to; but at the older ages the rate of mortality is very much greater.

At present it is difficult, if not impossible, to account for this peculiarity, whether it be due to the different circumstances and habits of life of our continental neighbours, or whether it arises from some mutation in the physical condition of the assuring classes in recent years, and is common to our own country, it is difficult to say, for we have no sufficient amount of data relating to the last twenty-five years, within which the facts of the Gotha Life Office are limited; but that some such explanation may be possible is supported by the large body of facts analysed in the following paper, on the Mortality of the Provident Classes in this Country and on the Continent.

Professor Gill, the late Actuary of the Mutual Life Assurance Company of New York, has reported on the rate of mortality among the members of that society, during the eight years which had elapsed between its establishment and February 1851, and although the experience is not so extensive as that of the Gotha Life Office, still it embraces between 17000 and 18000 years of life, and is therefore valuable and curious, as shewing the same peculiar features in the rate of mortality described as characteristic of the Gotha Company's experience, only at the older ages the mortality is even higher than that of the other.

It would certainly be of great importance to the interests of life offices to determine accurately whether this be a permanent feature of the mortality prevailing generally, not only in this country, but elsewhere, among the assuring classes; and it is to be hoped that an effort will be made at no distant date to collect and convey, in an intelligible and satisfactory manner, the experience of the different assurance companies.

It should not, however, be lost sight of, that the rapid extension of the practice of life assurance of late years will render the data derived from the past experience of life offices yearly less applicable to their future operations.

Hitherto Life Assurance has, to a great extent, been confined to the comparatively wealthy, but now the practice seems to extend to the less wealthy and the humbler classes, and is, in fact, almost universally recognised by the industrious workmen of the country in connection with Friendly and Benefit Societies.

It may be stated that there is little chance of a future generation of the gigantic corporations boasting of their millions of invested capital and revenues, exceeding those of some of the States of Europe, springing up. It is more likely that an intermediate class



of companies will be called into existence, holding a position between that of the great corporate bodies established in the last and early in the present century, and the humble Friendly Society with which the working classes are familiar. If this supposition be well founded, or if it be admitted that Life Assurance will rapidly extend itself among all classes of the people, it is evident that the rate of mortality among the assuring classes must gradually approximate to that of the country generally.

No principle in vital statistics is better established than the widely-differing rates of mortality among different classes and ranks of society, and the more that assurances are confined to individual classes the more peculiar ought we to expect the rate of mortality to be, but, as the practice of assuring ramifies itself among all classes, so also will the rate of mortality gradually assimilate to that of the country at large; there is consequently reason to conclude that, with the extension of Life Assurance, the rate of mortality will become more favourable.

In support of this statement there is the most abundant evidence.

The past experience of Life Offices, as far as it can be made available in the solution of such a question, shews that the rate of mortality among the assuring classes, which chiefly belong to the middle and upper walks of life, is greater than that of the population at large. See Table H, No. 5, and pp. 39-42.

The corrected experience of the Government male annuitants also shews a higher rate of mortality, and, taking the result of observations on the Peerage as given by Mr. Edmonds and Dr. Guy, the rate of mortality among the highest ranks of society is very much greater than that of the whole population of this country. It will likewise, I have no doubt, be admitted that among the intemperate, the destitute, and the dissolute, the rate of mortality must also exceed the average for the people at large; hence, since all these groups experience a rate of mortality above the average of the whole population, there must be somewhere among the people a class which is subject to less than the average mortality; that class it is evident, from the exhaustive enumeration of the above groups, must be the industrious, provident workmen of our country, who do not fall within any of the other sections of the people just spoken of.

But the following pages contain much direct evidence to shew that the prudential portion of the working classes are really subject to a less rate of mortality.

Early in this century, considerable attention was given to the nature of Friendly Societies or Sickness Clubs, and, since the year 1824, the question of the sickness and mortality to which the members are subject has also engaged public attention, while, since 1835, some evidence of the rate of mortality prevailing among those societies has been before the country, and, for the last ten or eleven years, it is submitted that the present contributions has afforded the most conclusive evidence that the duration of life among the members of Friendly Societies generally is much greater than that of the country at



large, or the select classes dealing with Assurance Companies. Mr. Ratcliffe's investigations into the experience of Odd Fellow Societies, and the more recent inquiry made on behalf of the Government, and described in pp. 440-6, fully support this view of the question.

This immunity from disease among the humble and industrious workmen of the country, whose prudential habits are sufficiently strong to maintain them members of these clubs, is only what *à priori* might be expected. The fact of continuing a member of such a society pre-supposes great regularity of habits, otherwise difficult circumstance and distress would ensue, and, from inability to continue his subscription, non-membership follow. Hence, such a member may be regarded as a type of industry, frugality, regularity of habits, and simplicity of life.

If the health of the body is to be maintained it must co-exist with regularity of habits and uniform physical exercise. The member's avocation enjoin on him a diurnal repetition of the different functions of the body in a manner not required of the pampered, the indolent, the intemperate, and the dissolute. He has, therefore, his legitimate reward in the enjoyment of a long, a useful, and let us hope a happy and blessed life. If the operations of Life Assurance Companies should ever extend so as to embrace the classes now comprising the Friendly Societies, it is evident that the rate of mortality must diminish rather than increase; but should the practice of assuring lives stop short of that, it is still obvious that the same principle will hold good, although the improvement in health may not increase to the same degree.

Having dwelt at so much length on the nature and extent of the data now chiefly in use for the purpose of Life Assurance, it may not be out of place to point to an immense field in Vital Statistics which still remains uncultivated.

One of the most obvious which yet remains untouched, so far as the middle and wealthier classes are concerned, is the mortality of children. Private monographs I know exist on this question, but they are not yet available for public use; the following questions are of great importance to the actuary, not only in the more ordinary exercise of his functions but also in the special cases on which his advice is frequently sought by the public.

The influence of age at marriage on the fruitfulness of the marriage.

The influence of age at marriage on the mortality of children born therefrom.

The influence of age at marriage on the sex of issue, and also on the relative mortality of the first, second, and third born, as well as on each subsequent birth in consecutive order.

The probability of marriage in different ranks of life for each age and sex is also important to be determined; but one of the questions in which the actuary should be most interested, and for which he is but indifferently prepared at present, is that of the tests which should be applied to members seeking admission into an Assurance Society.



The very mention of this subject opens up to view a most fertile field of inquiry, almost entirely neglected even by the Medical Profession itself. Among more obvious questions may be mentioned the power of diseases usually called hereditary in developing themselves in succeeding generations of families in which they have once appeared.

The relation of mortality in general in one generation to that of the next generation.

Relation of the mortality in one section of a family to that of another or surviving section of a family.

The probability of the development of infantile and other non-recurrent diseases in relation to age.

The influence of infantile diseases on the mortality of survivors to mature life.

The practical importance of the preceding questions must be evident to those of even the most limited experience.

At present nothing but arbitrary tests exist, and, consequently, all the absurdities of caprice, instability, and prejudice, interpose in the place which should be occupied by the science, judgment, and disciplined skill of the actuary.

To obtain this amount of new data will involve great expense, much labour and patience, still abundant materials exist to afford the information required, and all that is needed is a resolute attempt to conquer the difficulties, but it is too much to expect that private individuals can afford to go to the expense of collecting materials for the purpose of enriching public companies, already plethoric in wealth, and whose speculations have been notoriously profitable in the history of trading enterprise. On this subject see the concluding paragraph in page 144.

The proper parties to bear the expense are the companies themselves. A few thousands out of the millions possessed by the assurance companies devoted to the acquisition of accurate data on the subject discussed would form one of the wisest and best investments which they could devise, and place their actuaries in the proper position of having to deal with facts and established principles, instead of the dogmas of prejudice and ignorance.

It may on first view occasion some surprise to find a Paper on Criminal Statistics in a work purporting to be Contributions to Vital Statistics, but I have no doubt a careful perusal of pp. 302-407 will satisfy any inquirer that every proper investigation into the state of crime of a country involves the consideration of so many of the most important elements of its vital statistics that the one branch of study necessarily includes the other. On examination of the large body of facts contained in this Paper, and the mode in which they have been treated, it will be found that the minuteness of detail into which it has been necessary to enter for the proper determination of the duration of life in various classes in the community, is even still more necessary for solving the different questions brought under discussion in regard to the prevalence of crime; in fact, until proper adjustments and corrections have been made on account of differences in the distribution



of the population according to age in different districts and communities, there is no possibility of arriving at correct views as to the relative tendency to crime in different districts of the country. As the population of every district is constantly undergoing changes in these conditions, such corrections are equally necessary, in order to determine whether crime be increasing or decreasing within given periods, either in the whole kingdom or in particular parts of it. An examination of the facts given in pp. 302-25, and in Table VII, page 322, shews, that if the tendency to crime had remained constant the distribution of the population of England and Wales, as in 1820, would give a ratio of *one* person in 365 of the whole male population being committed for crime in the course of the year; but, in 1841, the ratio would be *one* in 339; but by the census of 1851, the ratio would be also *one* in 339. Again, it will be found that between different districts of the country no correct comparison can be made unless such corrections be in the first place carried out. Otherwise it would appear that, on the assumption of the same tendency to crime existing there would, owing to differences in the distribution of the population, in one district of the metropolis, Bethnal Green, for example, be the ratio of *one* committed in 338 of the population, and in St. George's, Hanover Square, *one* in 280. Again, in Anglesea, Cardigan, Carmarthen, Dorset, Merioneth, Montgomery, and Pembroke, the ratio is *one* in every 360 of the male population; while in Glamorgan, Lancaster, Middlesex, and Monmouth, the same tendency would produce as high an average as from *one* in 325 to *one* in 315. This question is fully discussed throughout the Paper, and some striking examples given of the facilities afforded by attention to this element of the investigation while interrogating other features in the development of crime. The necessity for this correction arises from the fact that the tendency to crime at one period of active life is in both sexes more than quadruple that at another term of life, and also that the ratio of crime in the male sex is nearly five times as great as in the female sex, and, consequently, different ratios of the two sexes, and also differences in the distribution of the numbers of either sex, according to age, in different localities will produce apparent differences in the ratio of crime, when viewed, as is usual, in regard to the aggregate of the population only, although the actual tendency to crime at corresponding ages in the respective sexes may be precisely the same.

On referring to pp. 325-6, a curious law is disclosed as regulating the development of the aggregate crime at various ages. This law, if attentively considered, is calculated to throw much light on the progress of crime; but an examination of the analysis made of the tendency to specific forms of crime, in pp. 391-8, will shew how remarkably different is the law which regulates the tendency to particular forms of crime at different ages, and how unsuccessful all preventive measures must be unless an accurate knowledge exists of the particular tendencies to certain propensities and forms of crime at the different terms of life.



During the last quarter of a century much has been said and written, particularly in this country, and in France, on the statistical evidence which affects the relation between education and crime, and the very opposite conclusions arrived at by different inquirers it is submitted are quite reconciled by the more complete and accurate mode of investigation explained and followed out in pp. 353-91. If the crime which has hitherto prevailed in the various districts and groups of counties be analysed in the manner pointed out, so that the groups compared differ in respect of education only, it will be found that out of twenty-two different combinations formed of all the different districts of England and Wales, that in every instance there is an excess of crime where there is the least education or instruction, and comparing the respective sections of each group of counties, it will be found that there is an average excess of 25 per cent. of crime in the sections of inferior education over those of higher education, while in some districts the excess is as much as 44 per cent. These results, it will be seen, are derived from the application of the educational test to the general population of the district in which the crime is investigated; but the same contribution also shews that invariably in those districts in which there is an increased amount of crime there is likewise a higher ratio of uneducated criminals, and in the less criminal districts a smaller proportion of the criminal population is found to be wholly destitute of the rudest elements of education, and, continuing to trace the details of this investigation, there is found the following very remarkable combination of elements in the manifestation of crime.

The districts of the country in which the general population is the worst educated, the districts in which the greatest amount of crime prevails, and the districts in which there is the highest proportion of uninstructed criminals, are constantly found assimilating; while, on the other hand, those districts which are the best educated, the least criminal, and in which shews a smaller proportion of uneducated criminals, are likewise found to be identified in the various combinations.

It is hence obvious that the very small amount of education, or rather instruction, implied by the test employed in the following investigation, must have a powerful influence on the criminal calendar of the country, and a great reduction of crime may be therefore justly expected from a more general diffusion of education.

It may not be altogether out of place to remark here, that if the term education be held to signify the culture and elevation of the moral character, it is evident that its immediate and essential influence would be to destroy crime; in fact, in this sense, education and freedom from crime must bear the relation of cause and effect; and therefore, when education is at a maximum crime must, of necessity, be at a minimum; so that, if the term be thus explained, statistical evidence would be *à priori* unnecessary to solve the problem proposed: but if the term education be used in its ordinary acceptation, merely to imply instruction, it then becomes a fit and proper question,



whether education in this restricted sense has any influence on the repression of crime.

The educational tests employed in the following Contribution are fully explained in pp. 353 and 377, and it is believed that a careful perusal of the whole of the Paper on the Statistics of Crime, and the methods of investigation followed will, in the results arrived at, surprise even the best informed readers in finding so low a test of education or instruction as that employed to lead to so striking differences in the criminal condition of various districts of the kingdom. These results are, in every instance, so constant and positive as fully to establish the conclusion that education is one of the most powerful preventives of crime. Whatever other combinations may be attempted or made in the analysis, of which a great number will be found in connection with the manufacturing and agricultural condition of the various counties, no solution is arrived at as to what is the element or feature which produces in one great community an excess of fifty-two per cent. of crime, and in another reduces crime thirty-three per cent. below the average, but introduce the educational test and the whole problem is completely solved.

Immense correctional efforts are at the present time made in the shape of reformatories, and other institutions for the treatment of convicted criminals, but little or nothing is done to remove the causes of crime; and if it be admitted, as it is presumed from the evidence adduced in the following contribution, that education is the most powerful agent yet known in counteracting the criminal tendencies of the population, it becomes a question of vital importance for the Legislature to decide whether some more complete system of education, which would reach and saturate the whole juvenile population, should not be speedily devised. The country exercises the right of punishing crime, and it is a fair question for consideration whether it should not also recognise the duty and responsibility of removing some of the causes of crime. In the following paper it will be found that to one class of offences—those against property, committed without violence—are due three-fourths of the whole crime of this country; and, among the population of sixteen years of age and under, more than nine-tenths of all their crimes belong to this single class of offences. A few minutes reflection is enough to shew how soon a general and amply-developed system of education would tell on that portion of the rising population, who without it must soon swell the criminal calendar of the country.

The Contribution on the Statistics of Crime in England and Wales contains many other curious and important points of inquiry, and gives an analytical view of the Criminal Returns of this country for the twenty years 1836–55; and in pp. 403–7 will be found a condensed recapitulation of the general results of the investigation.

An examination of the course of inquiry pursued will lead every one seriously interested in the moral condition of the country to view with pain and regret the present most defective character of the Home Office Returns; in fact, for all statistical purposes



they are now worse than useless. They cannot, it will be found for reasons hereafter advanced, be employed in any exact inquiry. Ever since the year 1839 these Returns have been periodically undergoing such changes, and have been from time to time presented to the public in so defective a shape, that in the hands of unskilful persons they are likely to lead to the most erroneous and fatal conclusions.

At a time when throughout the whole civilised world the most strenuous efforts are being made, not only by individuals but by Governments, to systematise the records of all facts and phenomena bearing on the social and moral progress and happiness of the people, it is lamentable to find our own Home Office Returns in so retrogressive a condition as that pointed out in the commentaries in pp. 398-400.

It is believed that the elaborate analysis of Railway Accidents, given in pp. 230-301, for the period commencing the 1st of January, 1840, and ending 31st of December, 1856, if carefully studied by those entrusted with the details of railway management, would soon lead to many improvements which would speedily effect a great reduction in the number and severity of the accidents.

This Contribution cannot however fail to shew how erroneous the general impression on the public mind is in regard to the dangers of railway travelling, and more particularly so as regards the indiscriminate blame to be attached to the system of railway management.

The Paper contains evidence not only of a great diminution of all kinds of accidents, but, what is exceedingly satisfactory, of those accidents which are due to causes assumed to be under the control of the Companies. It is shewn, that while deaths from causes beyond control of the Companies have in the more recent years diminished in the ratio of 49 to 30, those from causes under control of the Companies have diminished in the ratio of 64 to 19. This result is certainly one not generally understood by the public, for not only are all railway accidents supposed to be very much on the increase, but those due to details of management are believed to be rapidly and alarmingly so. The facts of the case, however, do not support this view, for they disclose the truth that railway management, so far as accidents producing death are concerned, has greatly improved. Whether this change be due to the better general regulations enforced by the Directors of the Companies, or to the improved skill and intelligence of their officers and servants, still the results of the investigation afford the most striking testimony to the recent improvement and increased safety in railway travelling, and encourage the hope that the same means will be persevered in to effect a still further reduction in the frequency and intensity of railway accidents.

It has been said that the great bulk of accidents is due to collisions, but an inspection of Table XXI, page 257, will shew that they constitute the causes of 22·5 per cent. only of the whole deaths amongst passengers, and if the deaths of employés be included,



not quite one-fifteenth part of all the deaths are occasioned by collisions. An examination of the figures in Abstract L, page 261, will shew that the deaths of passengers from collisions at stations have in recent years decreased to about 58 per cent. of their ratio in earlier periods, and those from collisions elsewhere than at stations have been reduced to 25 per cent. of their original amount.

It is, however, most lamentable to learn, that of 174 collisions of which the causes are classified in Table XXII, page 263, no less than 104 have arisen out of what can be described as nothing short of the most culpable neglect. The facts recorded in that Table are of great importance, and although the Directors of Railway Companies have in recent years done an immense deal to protect passengers against loss of life and limb, they are still imperatively called on to take the subject of the frequently recurring collisions more thoroughly into consideration. When such most culpable neglect exists, as is evident by the facts disclosed in pp. 263-4, the public have a right to demand more complete protection. Much interesting information will be found in pp. 261-73 in regard to collisions and the manner in which passengers are affected by them.

The other important kinds of accidents from which passengers suffer, and which are assumed to be under the control or management of the Companies are those occasioned by trains or portions of trains running off the line. It will be found that they occasion 32.1 per cent. of all the deaths of passengers from defined causes. In fact, "collisions" and "running off the line" have caused 91 per cent. of all the deaths of passengers for which the Companies can be supposed responsible.

On referring to Table XXIX, page 276, a strange circumstance is observable. From the 51 cases of trains, or parts of trains, or engines "running off the line," occasioned by the state of the weather or machinery breaking, not a single death of a passenger happened, while the 30 cases of "running off the line," owing to the defects in the permanent way, produced eight deaths of passengers.

In regard to the collisions which have taken place from defects and breakage of machinery, the case is however unfortunately very different, for 34 collisions, attributable to this cause, occasioned as many as eleven deaths of passengers, and no less than 208 serious injuries. The causes of these are certainly, to a very great extent, completely under the control of the Companies. Of these 34 collisions, the great bulk was absolutely preventable by a sufficient amount of care. For example, an examination of Table XXII will shew that no less than fifteen are due to portions of the train becoming detached, and three to defective "breaks," and it is difficult to conceive any sufficient reason to justify a continuance or repetition of accidents from these causes. No doubt the coupling of carriages may, under extraordinary circumstances, be found to give way, even when great vigilance has been used; but such an excuse can be of no avail in the face of so many accidents of this kind, and there certainly does appear strong reason to



condemn the system of management which permits a series of collisions from such causes. In the same Table it will likewise be found that sixteen collisions actually took place owing to trains having been retarded by accidents to some portion or other of the engine. It is no doubt sometimes difficult to determine on inspection the defects in the mechanism of an engine, still the collisions from this cause have been so many that it is impossible to conceive that a due amount of scrutiny has been always exercised in the examination of the state of the locomotives. Defects and breakage of machinery have caused, either by "collisions" or "running off the line," as many as seventy-seven accidents, which have resulted in thirty-seven deaths to passengers and employés, and the large number of 273 serious injuries. Frequent inspection by competent parties is the protection against this group of accidents, and strong measures should be enforced to secure the safety arising from proper supervision.

Of the 308 collisions recorded in Table XXVII, page 272, no less than 110 have taken place at stations, or the very places where the greatest care and vigilance are required, and might be exercised. Anything like fair attention to the use of well understood precautions, and a proper employment of signals and telegraphs, should completely, or at all events to a great extent, remove this class of accidents.

The latter portion of the Contribution on Railway Accidents, pp. 278-301, merits deep and serious consideration owing to the results exhibited of the frightful amount of accidents and fearful loss of life to which the servants of Railway Companies are exposed. The facts contained in that portion of the Paper are of a very curious and certainly of a very striking nature, and must enlist, on behalf of the more important class of railway employés, the sympathies of all who may give those pages a careful consideration.

In pp. 93-9 are given several important facts relating to the Registration Act for Scotland, the 17th and 18th Vic., cap. 80, and illustrations furnished of the schedules and certificates proposed for use under that Act. During the year 1855, the first year in which the provisions of the Act were in operation, the complete schedules as contained in the Act were employed by the various Registrars, but since the beginning of 1856, those forms have been thrown aside, and schedules substituted which are scarcely more complete than the very meagre and defective forms now employed under the English Registration Act. This change is very much to be regretted, for any thing short of the original requirements of the Act cannot possibly supply the information so much needed for the legal purposes of the country, and demanded by the present state of statistical science.

The reasons assigned for making the change is the difficulty said to exist in procuring from all parties the full amount of information required by the Act, but it is very much to be feared that on this ground there is not sufficient justification for the alteration which has



been made. In page 99 *seq.* the probability of this difficulty arising was anticipated, and it was suggested that in Scotland, where no National Registration previously existed, the people would need, during the first few years of the operation of the Act, to be instructed as to the precise kind of information to be furnished in the event of a birth, death, or marriage. Had this been properly attempted and persevered in for three or four years no more difficulty could have been experienced in carrying out the original complete system of Registration than the present very defective one which has been substituted for it. Some influential member of the Government, it is hoped, will speedily take steps to cause the forms prescribed under the Act to be resumed, and their use may, in that event, before long be extended to England.

The Contributions on the Rate of Mortality in the Medical Profession, the Mortality of Master Mariners, and the Mortality among Persons of Intemperate Habits, contain many interesting results not appearing in any other Papers on Vital Statistics. In the latter of these there is a somewhat unexpected coincidence pointed out in page 225, in the remarkable similarity between the proportion of crime in the sexes to the proportion of deaths from assigned causes of intemperance. This question is worth further investigation, but not falling strictly within the scope of the present Contributions the inquiry has not been entered upon at much length.

Those interested in the management of Friendly, Benefit, and other kindred Provident Societies will find a large amount of information in regard to them in the following contributions.

The laws of sickness and mortality, as observed in the experience of these societies, are fully discussed in pp. 17-82, 160-4, and 408-68, and a great variety of data furnished, shewing the influence of trades, occupations, and local peculiarities on health. In the thirteenth edition of "Odd Fellow and Friendly Societies," published in the year 1851, it was stated that one of the most important questions which appeared to have engaged the attention of the recent Parliamentary Committees on Friendly Societies, was the sufficiency, for the purposes of Odd Fellow Lodges, of the data brought before the public in the first and second editions of this work—several of the witnesses examined contending that these lodges were exempt from much of the sickness to which Friendly Societies in general were subject: however, all doubts on this question have been removed by the publication of the rate of sickness actually experienced by the "Manchester Unity," and the results, it will be found from the analysis of them, given in pp. 423-8, *seq.*, confirm in a most remarkable manner the law of sickness developed in these Contributions. A striking practical illustration of this fact will be found by comparing the financial results of both sections of Table AX, page 496, deduced from the actual experience of the Order, with the corresponding results in Tables AR and AS,



pp. 479–80, which are based on the data originally appearing in these Contributions. The very remarkable agreement of these two classes of results, considering the data to have been collected from very different sources and by means quite independent of each other, must be exceedingly satisfactory to those interested in the progress of these institutions. It is understood to be the intention of the Manchester Unity, to make a further inquiry into the nature and amount of the sickness which prevails in the Order, and with this view the various lodges will be required to make the necessary returns of their experience, at the expiration of the next quinquennium, the end of the year 1860, and until then nothing further will be known of the ratio of sickness to which the great body of the Odd Fellows is subject. The analysis of the facts, already referred to, however, pretty conclusively shews, that whatever may be the experience of individual lodges they have, taking them in the aggregate, no immunity from the sickness hitherto indicated as characteristic of Benefit Societies in general, and a perusal of the various Quarterly and Annual Reports of the Unity, distinctly shews this to be now the opinion of most of the best informed members of the Order.

Attention is particularly directed to the observations and facts in pp. 440–6, on the Government Analysis of the sickness experienced by Friendly Societies during the quinquennium 1846–50, and printed in Parliamentary Papers No. 955 of 1853, and No. 506 of the year 1854. Since the disastrous publication of the Highland Society's Tables in 1824 perhaps no other so unfortunate event as the publication of what is termed the Government Tables has arisen in the history of Benefit and Friendly Societies, and into the nature of the mischief likely to be occasioned by it, I have fully entered in the pages already referred to. A careful perusal of those observations must satisfy every one, having a practical knowledge of the management of Friendly Societies, of the imminent danger of circulating such documents under Government sanction. If those entrusted with the Analysis of the Government Sickness Returns had but asked themselves the simple question—What is the true object of a Friendly Society? it is impossible they could have excluded from their analysis “chronic ailment,” “mere decrepitude,” “slight paralysis,” “blindness,” “mental disorder,” and “senile infirmity,” and have only included in the published results, presented for the guidance of Friendly Societies in the country, “sickness incapacitating from labour, *requiring constant medical treatment*, and of *limited duration*.” The object which a working man has in view, in joining a Benefit Society, is not only to provide for sickness of *limited duration, requiring constant medical treatment*. If this were the only purpose of Friendly Societies, they would be nothing more than a delusion and a curse to a provident working man. Against sickness of *limited duration*, men, whose prudential habits are sufficiently strong to retain their membership in Friendly Societies for two or three years, can, with a struggle, make provision even without the aid of a society; but how many working men can contend against the vicissitudes of any



description of "*chronic malady*," or protracted sickness? The true object and mission of Friendly Societies, when properly considered and as regarded by the working man himself, is to afford him a competent support and complete independence during periods of sickness, incapacity, and disease, however protracted; and it is to accomplish this object that not only the earliest but the most recently and best organized societies make special provision. Their object is not to form a stepping stone, to aid the industrious and prudent to pass from the active and manly independence of their days of vigorous labour, to the degraded pauperism of the Workhouse. Were Friendly Societies so constituted, they would be a disgrace to the country, and could never receive the support and sympathy of the people.

This is however the only practical effect which the general dissemination of the two Parliamentary Papers referred to can have, for by causing Friendly Societies to adopt scales of contributions and benefits, which make no provision for those very vicissitudes which are in fact the most trying to a member's independence, he is, at a time when the least prepared for it, declared off the funds of the Society, and has of course no alternative but to take shelter under the roof of the Workhouse. That this is the real direction and tendency of these Parliamentary Papers is fully shewn, in the Appendix to the First Report of the Registrar of Friendly Societies in England and Wales, dated the 18th July, 1856, and ordered by the House of Commons to be printed 21st July, 1856. The portion of the Appendix in question commences in page 37, and is entitled "Suggestions by John Tidd Pratt, Esq., the Registrar of Friendly Societies in England, for the establishment of Friendly Societies; with Tables of Contributions for payments in sickness, &c."

In page 39, he states that "Provision should be made, in the Rules, that nothing but sickness incapacitating from labour, and requiring constant medical treatment, and of limited duration, as contradistinguished from chronic ailments and mere decrepitude,—should be provided for, and that slight paralysis, blindness, mental disorder, or senile infirmity should not entitle a member to sick-relief from his society." And again, at page 48, it is stated that the Tables "are not intended to meet the case of chronic infirmity demanding little or no medical attention."

This is certainly a most extraordinary suggestion to come from one holding an appointment of so high pretensions. It would be interesting to know the Registrar's views of what the establishment of a Friendly Society is meant by him to effect. It surely cannot be his object to work out a mere problem in medical science, in order to determine the relation between acute and chronic diseases; and still looking at his suggestions in the most favourable light it is possible to regard them, no one can conclude that there is any intention to make Benefit Societies self-supporting Provident Institutions, which shall, during the physical vicissitudes to which all flesh is heir to, render their members



independent of the Parish and the Workhouse. A distinct provision is suggested to be made in the Rules to prevent members from receiving any relief during "chronic infirmity demanding little or no medical attention." Admitting, therefore, that it is quite possible for the members of a society to discriminate between cases of "chronic ailment and infirmity," in a way to effectually prevent litigation with sickness claimants, let us see what would be, under such circumstances, the position of the members of a society formed on the model recommended by the Registrar. On referring to pp. 445-9, *seq.*, a considerable amount of data will be found, shewing the ratio of protracted sickness to sickness generally: after the age of 40, it will be seen from Table NN, page 446, that the ratio of the number of persons suffering from protracted sickness to the total number of persons actually sick increases very rapidly, and during the term of life 41-70, the average ratio is as high as 14·5 per cent., the shortest duration of any one attack of such protracted sickness being one year, while many of them are of course of several years' duration. In the decennium of life, ages 61-70, the cases of protracted sickness extend to nearly 48 per cent. of the whole number. In the Appendix to Mr. Ratcliffe's Report, already referred to, and published with the Quarterly Report of the G.M. and Board of Directors, for January 1853, will be found some valuable information on this question; but the form in which the results are presented by Mr. Ratcliffe, does not shew the number of members subject to protracted sickness, but simply the average amount of that sickness to all the members of the lodges over which the observations extend.

| Ages. | AVERAGE SICKNESS PER MEMBER EXPERIENCED |                                     |                                    |                                                                      |                        |                        |                              | Ages. |
|-------|-----------------------------------------|-------------------------------------|------------------------------------|----------------------------------------------------------------------|------------------------|------------------------|------------------------------|-------|
|       | Within the first 12 months.             | Within the second 12 months.<br>(a) | After the second 12 months.<br>(b) | Table Z, p. 424.<br>Total, whether of short or long duration.<br>(c) | Ratio of<br>(a) to (c) | Ratio of<br>(b) to (c) | Ratio of<br>(a) + (b) to (c) |       |
| 18    | ·5030                                   | ·0018                               | ·0000                              | ·5048                                                                | ·3566                  | ·0000                  | ·3566                        | 18    |
| 23    | ·6677                                   | ·0204                               | ·0160                              | ·7046                                                                | 2·8952                 | 2·2708                 | 5·1660                       | 23    |
| 28    | ·7081                                   | ·0293                               | ·0276                              | ·7652                                                                | 3·8291                 | 3·6069                 | 7·4360                       | 28    |
| 33    | ·7579                                   | ·0492                               | ·0542                              | ·8607                                                                | 5·7163                 | 6·2972                 | 12·0135                      | 33    |
| 38    | ·8373                                   | ·0594                               | ·0814                              | ·9783                                                                | 6·0718                 | 8·3205                 | 14·3923                      | 38    |
| 43    | ·9963                                   | ·1070                               | ·1240                              | 1·2274                                                               | 8·7176                 | 10·1026                | 18·8202                      | 43    |
| 48    | 1·2101                                  | ·1616                               | ·2530                              | 1·6249                                                               | 9·9452                 | 15·5702                | 25·5154                      | 48    |
| 53    | 1·2882                                  | ·3311                               | ·5764                              | 2·1959                                                               | 15·0781                | 26·2489                | 41·3270                      | 53    |
| 58    | 1·7900                                  | ·5628                               | 1·1111                             | 3·4839                                                               | 16·1543                | 31·8924                | 48·0467                      | 58    |
| 63    | 2·7253                                  | 1·1421                              | 1·8972                             | 5·7655                                                               | 19·8092                | 32·9061                | 52·7153                      | 63    |
| 68    | 3·1666                                  | 1·3142                              | 2·4712                             | 6·9265                                                               | 18·9735                | 35·6775                | 54·6510                      | 68    |

It will thus be seen, that the average amount of sickness, in column (3) of this abstract, experienced within the second twelve months of sickness, ranges from 2·8952



per cent. to 19·8092 per cent. of the total sickness to which the members are liable; and the average amount of sickness, in column (4) experienced after the second twelve months' illness, varies from 2·2708 per cent. to 35·6775 per cent. of the total sickness; the ratio of protracted sickness to the whole amount of sickness, in both columns, increasing with advance of age, as shewn in columns (6) and (7). If attention be now given to the results of column (8) of the preceding abstract, they will be found to throw considerable light on the painful condition in which those societies which, following the advice of the Registrar, adopt the Government Tables, must be placed. It will be there seen, that the protracted sickness varies from 5·1660 per cent., of the total sickness, at age twenty-three, to 54·6510 per cent., at age sixty-eight. These results, with those already quoted from Table NN, page 446, shew abundantly the serious defects in the Government Analysis. But it may be still important to refer to Table QQ, page 448, in which will be found some curious information on the relation of permanent to temporary sickness under various forms of disease, and it will be found that in Class IV, Diseases of the Brain and Nervous System, there is the highest ratio of permanent and protracted sickness; and viewing that fact in connection with the results in Table XIV, page 182, and the Abstract in page 183, it will be seen that after the age of 40, this class of diseases grows rapidly in intensity, and hence the frequency with which, after that time of life, members of Friendly Societies will become claimants for permanent and protracted sickness.

The question now arises, what are the members belonging to those societies, formed in accordance with the advice of the Registrar of Friendly Societies, to do while suffering from this protracted or "chronic" sickness? They can get no relief from the society, and in his Report and in its Appendix of Suggestions, not a single syllable is written on the subject, in fact all allusion to this important feature is carefully avoided; and from pp. 444-5, *seq.*, it will also be found that in the published Analysis of the Government Returns themselves, the nature and extent of the "chronic ailment and mere decrepitude" are nowhere given, so that so far as those documents and the Registrar's instructions are concerned, the promoters, and those interested in the management of Friendly Societies, have no choice, but to follow implicitly the Government Tables, and permit about one member in seven, of the sickness claimants, above the age of forty, to be drafted to the Workhouse. Had the eliminated elements, in question, been given as a separate and distinct series of results, data would have been available for societies to make the necessary provision for "chronic ailment and mere decrepitude;" but nothing of the kind has been done. It is therefore hoped, that all interested in Friendly Societies will soon become fully aware of the defective and most disastrous aspect under which the results of the Government Analysis of Sickness has been submitted to the public.

I have elsewhere shewn, that any one giving attention to the examination of the different witnesses, before the recent Parliamentary Committees, must have observed a



strong tendency, on the part of the members, towards the adoption of Model Tables of Rates of Contributions and Benefits. In Appendix (A) to the Report by the late Lord Beaumont's Committee, House of Lords, Session 1847-8, paper No. 126, I have furnished some striking illustrations of the varying liabilities to which different societies are subject; but the additional examples, now furnished in pp. 408-530, are certainly very curious and remarkable, both in a scientific and practical point of view, and conclusively prove that few things could be more dangerous to the interests of Friendly Societies, than the adoption of Model Tables. There is nothing connected with the study of a statist and the profession of an actuary, requiring more judgment and experience, than the proper discharge of the duties devolving on him in giving advice to Benefit Societies, and every day shews more clearly, that the circumstances in which different societies are placed, are so dissimilar as to render the liabilities of one, no criterion for those of another.

The members of Benefit Clubs and Odd Fellows' Lodges, should give serious consideration to pp. 513-21, *seq.*, on a point of much importance in the formation and management of these societies. Little has yet been done to urge the necessity of every one of these clubs or lodges having a sufficient number of members to realize an average ratio of sickness and mortality; but the facts and illustrations, given in the following pages, will, it is hoped, lead to more generally correct views and better practical managements in this respect.

Much is said in the following pages, on the subject of Odd Fellow Societies, and what is written gives a faithful and accurate representation of the state of the order, at the time the 13th edition of "Observations on Odd Fellow and Friendly Societies" appeared. Since that time, important changes have taken place in the government and management of the lodges, although but little alteration in their financial condition, and it is, however, right that these financial improvements should be pointed out.

At the A.M.C., held at Preston, in May 1853, a new scale of initiation and an increased ratio of contribution was adopted, for all members admitted into the Unity after the 1st August, 1853. The following is the 145th general law then adopted and still in force in the Order:—

"That no person of improper character, nor any one under the age of 18 years shall be made a member of this order, *or any person be allowed to be a member of two lodges in the Unity.* Any member who proposes a person contrary to this law shall be liable to be fined twenty-one shillings, and not less than ten shillings and six-pence, whether the person proposed be admitted or not. The charges for initiation to be as follows:

|                      |    |       | £. | s. | d. |
|----------------------|----|-------|----|----|----|
| 18 and not exceeding | 24 | ..... | 0  | 5  | 0  |
| 24                   | "  | 27    | 0  | 7  | 6  |
| 27                   | "  | 30    | 0  | 10 | 0  |
| 30                   | "  | 32    | 0  | 15 | 0  |
| 32                   | "  | 36    | 1  | 0  | 0  |



And every member initiated, in accordance with the above scale, shall pay the following annual payment or contributions in addition to the usual contributions paid by other members.

|    |                       |                                | £. | s. | d. |
|----|-----------------------|--------------------------------|----|----|----|
| 18 | and not exceeding 22, | additional annual Contribution | 0  | 0  | 0  |
| 22 | „                     | 24                             | 0  | 0  | 6  |
| 24 | „                     | 27                             | 0  | 2  | 0  |
| 27 | „                     | 30                             | 0  | 3  | 4  |
| 30 | „                     | 32                             | 0  | 4  | 3  |
| 32 | „                     | 33                             | 0  | 4  | 5  |
| 33 | „                     | 34                             | 0  | 5  | 8  |
| 34 | „                     | 35                             | 0  | 6  | 7  |
| 35 | „                     | 36                             | 0  | 7  | 6  |

And districts shall have discretionary power to admit persons above 36 years of age, upon payment of £.1, and the yearly contributions of the lodge, together with the additional annual payment of 7s. 6d. for each and every year the age of the person proposed exceeds 36 years. Deaf and dumb persons may be admitted members of the Order."

The consequence of the adoption of this general law is that all members admitted after the 1st of August, 1853, shall, in order to be entitled to the benefits specified in page 498, *seq.* and which may be fairly said to represent the average amount of benefits provided for by the members of the Unity, namely, an allowance of 10s. per week during sickness, a payment of £.10 at the death of a member, and £.5 at the death of a member's wife, have to contribute according to the following scale:—

| Age at Entrance. | Yearly Contribution<br>= (a) | Initiation Fee<br>= (b) | Equivalent Annual Contribution. |
|------------------|------------------------------|-------------------------|---------------------------------|
|                  | £. s. d.                     | £. s. d.                | £. s. d.                        |
| 18               | 1 1 8                        | 0 5 0                   | 1 1 11                          |
| 19               |                              |                         | 1 1 11                          |
| 20               |                              |                         | 1 1 11                          |
| 21               |                              |                         | 1 1 11                          |
| 22               | 1 2 2                        | 0 7 6                   | 1 2 5                           |
| 23               |                              |                         | 1 2 5                           |
| 24               |                              |                         | 1 4 2                           |
| 25               |                              |                         | 1 4 2                           |
| 26               | 1 3 10                       | 0 10 0                  | 1 4 2                           |
| 27               |                              |                         | 1 5 5                           |
| 28               |                              |                         | 1 5 5                           |
| 29               |                              |                         | 1 5 5                           |
| 30               | 1 4 11                       | 0 15 0                  | 1 6 9                           |
| 31               |                              |                         | 1 6 9                           |
| 32               |                              |                         | 1 7 0                           |
| 33               |                              |                         | 1 9 3                           |
| 34               | 1 6 0                        | 1 0 0                   | 1 10 4                          |
| 35               |                              |                         | 1 10 4                          |



That the effect of the admission of future members into the Order on this scale may be fully seen, and the extent to which the observations made in pp. 497-529, *seq.* will be thereby modified, let a parallel case to that discussed in page 498 be considered. It is there shewn that, according to the data furnished by Mr. Ratcliffe in his very able and valuable report, and deduced from the actual experience of the Manchester Unity itself, the contributions which should be paid by members aged thirty-two (which, according to Mr. Ratcliffe's report, was nearly the average age of the members), in order to provide the precise benefits above specified, is the sum of £.1 18s. yearly; while the actual amount required by the above table, which represents the rates adopted at the annual meeting held at Preston in 1853 is only £.1 6s. and making allowance for the entrance fee of £.1, this contribution is raised to no more than £.1 7s. yearly, shewing, even according to the actual experience of the Order, an annual deficit on each member's contributions of no less than 11s. or, in other words, the scale of contributions in the Preston table would need to be augmented upwards of *forty* per cent. to fully provide for the benefits promised to the members of the Unity.

It will also be seen from page 498 *seq.* that the contributions according to scale No. 1, as prepared by the Board of Directors for the use of lodges in the Unity, and which is still applicable to all the existing members who have been admitted prior to August 1853, equivalent to £.1 2s. 9d. annually, to provide the same benefits; and, consequently, that scale requires an increase of 15s. 3d. yearly, or about an addition of sixty-seven per cent. to render their contributions commensurate with the benefits promised to this class of the members, who, at the commencement of that year were good on the books, numbered no less than 230,226. It is here evident that so far as all the older members are concerned, the relation of their contributions and benefits remains unaltered from the state of things represented in the following pages. It has, however, just been shewn that the New Scale of Contributions for age thirty-two exhibits an annual deficit of *forty* per cent. From data, however, which will be immediately presented, it appears that the average age of the members admitted to the Unity during the triennium 1853-5, was twenty-three years, and at this age, according to Mr. Ratcliffe's data, derived from the experience of the Order itself, and developed in Table Z, page 424, and Tables AU, AV, AW, and AX, pp. 494-6, *seq.* it will be found that the annual contributions required for the benefits already specified is the sum of £.1 8s. 6d. while that according to the Preston Table, after making allowance for the value of the Initiation or Entrance Fee, is only £.1 2s. 4½d. being a deficiency of 6s. 1½d. yearly; and, therefore, to make the table at that age self-supporting, the yearly payment would require to be increased upwards of twenty-seven per cent. To this extent will the contributions of all present and future members admitted under the Preston scales be deficient, while the contributions of all those admitted prior to August 1853 will be deficient to the alarming extent of sixty-seven per cent.



It is impossible, with any shew of reason, to deny these conclusions. They are derived directly from the experience of the Manchester Unity itself; but had I quoted from my own previously published data, as appearing in the other tables of this contribution, and already fully discussed, results almost precisely similar would have been obtained. There are few researches in the domain of vital statistics in which two independent investigations in different fields of inquiry have produced results so strikingly confirmatory of each other.

It may be important to shew for quinquennial ages the relation between the two scales now mentioned, and the rates deducible from the experience of the Order, which are necessary to provide the same benefits.

| Age. | Yearly Contributions now required from Members who entered the Unity |    |    |                     |    |    |
|------|----------------------------------------------------------------------|----|----|---------------------|----|----|
|      | Prior to August, 1853.                                               |    |    | Since August, 1853. |    |    |
|      |                                                                      |    |    |                     |    |    |
|      | £.                                                                   | s. | d. | £.                  | s. | d. |
| 20   | 1                                                                    | 1  | 8  | 1                   | 1  | 8  |
| 25   | 1                                                                    | 1  | 8  | 1                   | 3  | 10 |
| 30   | 1                                                                    | 1  | 8  | 1                   | 6  | 0  |
| 35   | 1                                                                    | 1  | 8  | 1                   | 9  | 3  |

An examination of the preceding figures will satisfactorily shew the manner in which the financial resolutions of the Preston A. M. C. will affect the condition of the Order. Unless an immense number of the older class of members should secede from the Unity, and relieve it of their liabilities, it is undeniable that the deficit pointed out in the earlier editions of this work, and fully explained in pp. 497-514, may still be held as fairly representing the perilous condition of the Manchester Unity, even at this time.

I have good reason for knowing, that it is not the opinion of the best informed members and officers of the Order, that the scale adopted at the annual meeting at Preston, in the year 1853, is high enough in its terms to provide the benefits promised under it, but it is, no doubt, as may be seen in the preceding illustrations, an improvement on those previously in use by the Manchester Unity. The fact is, as shewn in pp. 503 and 505, the Board of Management has struggled for years with the question, and are unable suddenly to carry out a thoroughly sound and amply developed system of financial reform, and looking at all the circumstances of the case, this is scarcely to be wondered at.

There can be no question whatever, that notwithstanding the recent changes effected by the Preston table, the rates and contributions required of the members are still entirely



inadequate to provide the benefits promised, and, unless some very marked improvement be made in the adjustment of benefits and contributions, the Manchester Unity can never become a great and useful provident institution. If its present scheme does not undergo such modifications as have been clearly shewn to be necessary by its own data and experience, the Unity must either speedily disappear, or continue in the unsettled, unsatisfactory, and unstable condition in which it has been for the last ten or twelve years. An examination of the Quarterly Reports of the G. M. and Board of Directors shews that in the triennium 1853-5, no less than 47,274 new members entered the Unity. This should act as a warning. The directors, as stated in page 502, *seq.* remark in one of their reports, " That the amount of initiation money received from members in 1844, being no less a " sum than £.49,382, it will be observed, on reference to the list of lodges, that our increase " of members in that year was only 21,461, and by these returns, it is clearly proved that " upwards of 40,000 members were initiated in 1844, thereby at once affirming that " upwards of 20,000 members left the Order in one year, after paying their initiation " money and contributions for a length of time. We are of opinion that the particular " attention of the members of the Order should be drawn to this important fact, with a " view of arriving at the true cause why so many leave the Order."

It would hence appear that the same lamentable state of things continues, for, notwithstanding the large number of new members joining the association, 47,274 having entered during the three years 1853-5, and, as hereafter shewn, the admissions were in preceding years in even a higher ratio, still the members have not increased since the beginning of 1844. At that date, the number of members is represented in one of the director's reports to be 251,727, and now we find, from the quarterly report for April, 1856, that, at the beginning of that year, the number good on the books was 251,008. This is, perhaps, the very worst circumstance which can be urged against the present state of the Manchester Unity. The influences must be very powerful which have caused so many members of late years to desert the Order in this wholesale manner, and is no doubt one of the reasons why many lodges have augmented their funds even with a scale of contributions, which would, under a normal and less perturbed state of membership, be ruinously low and inadequate. It happens to be within my knowledge, that when valuations of the assets and liabilities of some of the lodges have been made, that although they were found to be charging insufficient contributions for the benefits granted, still they were declared to have a surplus of assets over liabilities, and this fact was accounted for by the great number of members leaving the lodges and sacrificing their initiation money and their contributions for several years.

This fluctuating condition of membership is much to be deplored, and I am afraid it will long continue, unless by a speedy and proper adjustment of the contributions and



benefits, members are led to place greater confidence in the permanence and stability of the Order.

It is also important to contrast the condition of the Unity in respect to the number of members within the twelve years which have elapsed since January 1844, with that of the immediately preceding ten years.

In the year 1834, the number of members in the Unity was about 60,000; in January 1844, it had increased to no less than 251,727, being an absolute increment, after allowing for deaths and withdrawals, of more than 19,000 per annum; but within the last twelve years no increase would appear to have taken place, although these latter years constitute undoubtedly the period of greatest prudential progress in the history of Benefit Societies. It must be admitted, that the gigantic proportions of the Manchester Unity have attracted so much public attention to its affairs, and the question of its stability has, within recent years, been so openly and freely discussed before Parliamentary Committees and elsewhere, that it was impossible for members to repose the same confidence in the safety and permanence of the institution which they willingly lent to it during the earlier period of years.

It is highly important for those taking an interest in this great Friendly Society to understand clearly the nature and extent of the changes going on amongst the members in recent years, and the following succinct Abstract has, from the data furnished in the Quarterly Reports, been prepared for that purpose.

| Year.  | Members less than Twelve Months in arrear on the first day of the Year. | New Members initiated. | Deaths. | Lodges Suspended for non-compliance. |                    | Lodges Expelled from the Unity. |                    | Lodges Closed, by a Division of Funds. |                    | Lodges Closed by want of Funds, small Number of Members, Failure of Banks, &c. &c. |                    | Lodges Seceded from the Unity. |                    | Lodges Amalgamated with other Lodges. | Number of Members who have ceased to belong to the Unity on their own account. |
|--------|-------------------------------------------------------------------------|------------------------|---------|--------------------------------------|--------------------|---------------------------------|--------------------|----------------------------------------|--------------------|------------------------------------------------------------------------------------|--------------------|--------------------------------|--------------------|---------------------------------------|--------------------------------------------------------------------------------|
|        |                                                                         |                        |         | Number of Lodges.                    | Number of Members. | Number of Lodges.               | Number of Members. | Number of Lodges.                      | Number of Members. | Number of Lodges.                                                                  | Number of Members. | Number of Lodges.              | Number of Members. |                                       |                                                                                |
| 1850   | *224,878                                                                | 10335                  | 2189    | ..                                   | ..                 | 1                               | 51                 | 73                                     | 1809               | ..                                                                                 | ..                 | 32                             | 1641               | 30                                    | 4846                                                                           |
| 1851   | 229,975                                                                 | 10213                  | 2451    | 18                                   | 1012               | 4                               | 137                | 34                                     | 1324               | 6                                                                                  | 98                 | 23                             | 1637               | 36                                    | 8668                                                                           |
| 1852   | 225,194                                                                 | 10712                  | 2565    | 11                                   | 1011               | 4                               | 225                | 37                                     | 1447               | 3                                                                                  | 47                 | 11                             | 537                | 16                                    | 5581                                                                           |
| 1853   | 224,441                                                                 | 16618                  | 2728    | 11                                   | 654                | 2                               | 144                | 23                                     | 813                | 18                                                                                 | 615                | 11                             | 654                | 21                                    | 3188                                                                           |
| 1854   | 232,228                                                                 | 18836                  | 2768    | 8                                    | 336                | 1                               | 46                 | 15                                     | 539                | ..                                                                                 | ..                 | ..                             | ..                 | 20                                    | 6876                                                                           |
| 1855   | 240,499                                                                 | 21319                  | 2724    | ..                                   | ..                 | 2                               | 39                 | 9                                      | 360                | 13                                                                                 | 157                | 7                              | 286                | 19                                    | 7244                                                                           |
| Total. |                                                                         | 88033                  | 15425   | 48                                   | 3013               | 14                              | 642                | 191                                    | 6292               | 40                                                                                 | 917                | 84                             | 4755               | 142                                   | 36,403                                                                         |

\* Good on the Books only.

It will be seen from the above figures that in six years no less than 88,033 new members entered the Unity. The number of deaths amounted to 15,425, but the large number of 52,022 members seceded from the Order from the various causes assigned



in the preceding Abstract. It has already been stated, that on the 1st of January, 1856, the number of members was 251,008, and from a succeeding Abstract, given in page xxxiii, it will be found that the new members initiated during the eight preceding years was 108,410, or about forty-three per cent. of the existing members. It is further shewn in the Quarterly Reports that on the 1st January, 1846, the Order numbered 259,374 members. This number, it will be seen, gradually fell, until on the beginning of 1853 it reached 224,441, and from that time it has increased in the rapid manner shewn in the preceding Abstract, and bids fair to reach the maximum number attained in 1846.

This great fluctuation in the members, the unprecedented number of initiations, and the equal number of withdrawals, keeps the Unity, as already remarked, in the most unsettled, unstable, and unsatisfactory condition. Were its financial arrangements placed on a satisfactory basis more confidence would be inspired, the privilege of membership would be more valued, and no doubt seceders greatly reduced in number.

For a variety of important purposes the following figures, taken from the Quarterly Reports, throw valuable light, not only on the present condition of the Unity, but the economic and moral state of the working classes generally, and they should be carefully studied by every one watching the social progress of the day. In the Contribution on Criminal Statistics, pp. 303, 369, and 403, it will be found that the period of life of highest criminal intensity is ages 21-25, and hence arises the important practical bearing of all Benefit Societies on the moral condition of the people. Those are the very ages when admission to Friendly and Odd Fellow Lodges is most easy, and the following Abstract shews that during the years 21-25 as many as 42.983 per cent. of all the admissions took place between those ages. Viewing in connection with these results the well known fact that the least criminal portion of the whole community is represented by those who attach themselves to Benefit Clubs and Odd Fellow Lodges, it is evident that by means of these societies a very powerful and most beneficial influence may be exercised over that most important section of the population whose habits are as yet unformed, who have just entered upon the period of life of greatest criminal temptation, but who are still at the same time the most susceptible of acquiring those prudential feelings which find their best expression through the medium of their own Provident Institutions. Afford a young man the opportunity of joining well organised societies, and the respect he has for the opinion of his fellow members will exercise a powerful check on his criminal propensities.

The following gives the number of members who have joined the Manchester Unity of the Independent Order of Odd Fellows during each of the eight years 1848-55.



| AGE.           | 1848. | 1849. | 1850. | 1851. | 1852. | 1853. | 1854. | 1855. | TOTAL. |
|----------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| 18             | 1066  | 953   | 1159  | 1070  | 1173  | 1965  | 2187  | 2343  | 11916  |
| 19             | 1235  | 1073  | 1229  | 1121  | 1186  | 2009  | 1969  | 2111  | 11933  |
| 20             | 941   | 786   | 829   | 803   | 832   | 1599  | 1913  | 2152  | 9855   |
| 21             | 1256  | 1152  | 1260  | 1266  | 1234  | 2236  | 2522  | 2670  | 13596  |
| 22             | 992   | 910   | 925   | 890   | 1062  | 1596  | 1911  | 1999  | 10285  |
| 23             | 962   | 810   | 774   | 895   | 900   | 1578  | 1839  | 2010  | 9768   |
| 24             | 773   | 732   | 694   | 701   | 693   | 1025  | 1171  | 1374  | 7163   |
| 25             | 604   | 596   | 568   | 628   | 610   | 895   | 814   | 1071  | 5786   |
| 26             | 629   | 635   | 698   | 661   | 696   | 840   | 1064  | 1218  | 6441   |
| 27             | 484   | 429   | 410   | 441   | 471   | 478   | 723   | 846   | 4282   |
| 28             | 394   | 412   | 378   | 385   | 381   | 500   | 557   | 688   | 3695   |
| 29             | 428   | 391   | 411   | 412   | 445   | 562   | 655   | 796   | 4100   |
| 30             | 290   | 278   | 277   | 302   | 234   | 339   | 355   | 479   | 2554   |
| 31             | 200   | 179   | 231   | 210   | 303   | 282   | 306   | 360   | 2071   |
| 32             | 159   | 169   | 177   | 156   | 188   | 245   | 267   | 315   | 1676   |
| 33             | 120   | 92    | 108   | 93    | 103   | 124   | 170   | 224   | 1034   |
| 34             | 29    | 74    | 89    | 72    | 72    | 125   | 135   | 214   | 810    |
| 35             | 58    | 41    | 46    | 53    | 61    | 109   | 156   | 231   | 755    |
| 36             | 25    | 20    | 31    | 24    | 31    | 53    | 58    | 128   | 370    |
| 37             |       |       | 14    | 10    | 13    | 21    | 25    | 27    | 110    |
| 38             |       |       | 8     | 9     | 5     | 9     | 10    | 14    | 55     |
| 39             |       |       | 4     | 8     | 9     | 7     | 10    | 35    | 73     |
| 40 and upwards |       |       | 15    | 3     | 10    | 21    | 19    | 14    | 82     |
| Total...       | 10645 | 9732  | 10335 | 10213 | 10712 | 16618 | 18836 | 21319 | 108410 |

The following is a condensed Abstract of the preceding results :—

| Ages.          | Admission in the Years 1848-55. | Ratio of Admission at each term of Life. | Ages.          |
|----------------|---------------------------------|------------------------------------------|----------------|
| 18 to 20       | 33,704                          | 31.089                                   | 18 to 20       |
| 21 ... 25      | 46,598                          | 42.983                                   | 21 ... 25      |
| 26 ... 30      | 21,072                          | 19.437                                   | 26 ... 30      |
| 31 ... 35      | 6,346                           | 5.854                                    | 31 ... 35      |
| 36 and upwards | 690                             | .637                                     | 36 and upwards |
| Total ...      | 108,410                         | 100.000                                  | Total.         |

From the preceding figures it will be seen that during the eight years, 1848-55, no less than 74.072 per cent. of all the admissions took place under twenty-six years of age, and the large proportion of 93.509 per cent. at ages not exceeding thirty.

Although it may appear, that notwithstanding the improvement in the Preston scale of contributions on the preceding ones in use, I have still presented a very unpromising picture of the present condition and prospects of the Unity ; it would, while doing so, be



wrong to conceal the fact of other important changes having taken place since the publication of Mr. Ratcliffe's valuable Report in 1850. In the earlier editions of "Observations on Odd Fellows and Friendly Societies," it was distinctly affirmed (*See* second paragraph page 527 *seq.*) that much good would flow from the publication of the results of any such investigations as that subsequently and so ably conducted by him. It is, therefore, most satisfactory to find this view of the matter practically verified.

Since that time, as already stated, the large majority of lodges has improved their rates of contributions, either by increasing the periodical payments, or in lessening the benefits by reducing the amount of funeral gift, and limiting the time to which members are to be entitled to full sick allowance. This latter step, on many grounds objectionable, has only the merit of bringing the contributions and benefits nearer to each other in value. Mr. Ratcliffe, in the Appendix to the Quarterly Report for January 1853, has actually calculated specimen Tables for the lodges in which it is assumed that the benefits in sickness will finally be reduced to three shillings per week, and, in old age, to two shillings and sixpence weekly. It can however never be meant to reduce Odd Fellow Lodges to so degraded a position; the title of the Order must be altered first. It could never be called an "Independent Order" by thus making it a mere receptacle of infirm paupers for the workhouse. In no instance should the allowance granted to members be permitted to fall below such sum as would be self-supporting. If the rates of contributions be inadequate for that purpose, the proper remedy is to increase them. I am also given, on the best authority, to understand that there is now not a single branch of the Unity which does not keep its management expenses separate and distinct from the funeral and sick-gift funds. This is, indeed, an unmistakeable advance in the right direction. The Unity is also now a registered society. From the Quarterly Report for April 1856, it appears that, at the beginning of that year, "two hundred and ninety-five districts, containing 190,414 members, have registered their laws, and one hundred and thirty-eight districts (including foreign and colonial), containing 60,526 members, still remain unregistered as districts, but many lodges in those districts have availed themselves of the privileges conferred by the Friendly Societies' Act, and have registered their rules." All these societies must, therefore, make quinquennial returns to the Registrar of Friendly Societies, and the preparation of these is certain to lead to inquiry on the part of members, inquiry to discussion, discussion to clearer views and more carefully formed opinions, and thence giving birth to wiser laws and regulations. Some lodges are also adopting the plan of having periodical valuations of their assets and liabilities—a thing some years ago altogether unheard of amongst them. This, if general, would lead to the best results; but, if deferred until too late a period, lodges may find it impossible to recover themselves from the effects of past deficiencies.



Recently there has been revived, in one or two influential quarters, proposals to establish what are generally termed Yearly Societies. These will be found alluded to in Question No. 477 of Lord Beaumont's Report, and are undoubtedly the most objectionable of all sorts of Benefit Societies, as the members are simply required to meet the current risks of the year; they do not recognise the principle which is the foundation of all true Friendly Societies,—that of making a provision in youth for the winter of life. This is a principle which the physical laws of nature and the necessities of civilisation impose on the promoters of every Friendly Society, and it may be easily shewn that if an attempt be made to evade it, the formation of a permanent Friendly Society is impossible. Let it be assumed that a club is formed on the bases of the contributions providing for the necessities of the year only, and that, in the first instance, the members consist chiefly of young men, ranging from twenty to thirty years of age; on referring to Table E. pp. 26–7, and Table V. page 409, it will be found that, for the average of the first period of ten years a contribution of about nine shillings, from year to year, would suffice to grant sickness allowances of ten shillings a week to those who are invalided. During the next ten years, when the ages of the original members of the society range from thirty to forty, the contribution for the same benefit will need to be only slightly raised, namely to ten shillings from year to year. Such societies usually balance their affairs at the end of each year, and then begin *de novo*; but whether this be done or not, and a fresh election of members takes place, is immaterial for the purpose of the following illustration. On referring to column (8) of the Abstract on page xxiv preceding, it will be found that from five to fourteen per cent. of all the sickness experienced by members at the periods of life now under review is sickness protracted beyond the period of one year's duration. Again, assuming the society to go on for another period of ten years, when the original members shall range from forty to fifty years of age, the contributions from year to year, to provide the same benefits will require to be increased to about sixteen shillings, but in this decennium the sickness which shall be experienced after twelve months duration will amount to from about nineteen to upwards of twenty-five per cent. of the whole sickness to which the society is liable, and the sickness which shall actually be experienced after two years invaliding is no less than from ten to fifteen per cent. of the whole. Hence the question arises, would the healthy members of a society thus constituted consent to so severe and almost permanent a burden? Would they not, when balancing their books from year to year naturally complain and object to the renewal of the membership of those who are receiving so much of the proceeds of their contributions? For example, according to Table NN, page 446, *seq.* five per cent. of the members during the decennium now under consideration would, in lieu of their small contributions, have received a minimum £.26 each, and some of them three or four times that amount, but in the next decennium fourteen per cent. of all the members would be in this condition, and the ratio,



as shewn in Table NN, going on rapidly increasing. Yearly Societies have not, however, existed long enough to go through this ordeal. In the ten years we are now considering, when the ages of the original members range from fifty to sixty, a further, and perhaps a more serious practical difficulty is obvious. To provide for the current liabilities, the contributions would need to be nearly doubled, or £.1 10s. yearly, and those members who pass on to the next decennium would have to pay the impossible sum, for the time of life, of four guineas a year, exclusive of the payments necessary to make provision for funeral allowance to the member or his wife, pensions or annuities in old age, and the expenses of management of the society.

It is scarcely necessary to argue that from the physical impossibility of escaping numerous cases of protracted sickness at all periods of life, and the very high ratio of general sickness at the more advanced ages, rendering it impossible for working men at that time to provide for the current liabilities out of their earnings, the management of a "Yearly Friendly Society" is impracticable, unless at the younger ages; hence exists the usual rule of excluding from such societies all persons from membership beyond a given age, say forty or fifty-five. To encourage the formation of such societies would be to inflict a severe blow on all those who might be tempted to join them. They are destructive of the real purpose for which Benefit Societies were originally intended; inasmuch as the old and infirm, for whom Provident Institutions are most destined to do good, cannot avail themselves of them, and they certainly stand in the way of persons entering better constituted societies, for they draft off members in the vigour of life, and only retain them until such time as when, from advanced age, the necessarily high scale of contributions practically excludes them from admission to the best class of Friendly Societies.

The experience of all the best constituted societies demonstrates the impracticability of the working classes joining them in any considerable numbers, except at the younger periods of life—under the age of thirty. From that age to forty, owing to the rapidly-increasing rates of contributions, the numbers are very small, and beyond the age of forty, the numbers become exceedingly limited. Even in the Odd Fellow Lodges, possessing many social inducements to membership, this is borne out in a remarkable manner by the facts set forth in the Abstract in page xxxiii preceding. The liability to sickness and death is at a comparatively low ratio at the younger ages, and unless members, by entering a society at early life, pay rates of contributions more than equivalent to meet the evils of the hour, a time will arrive when the sickness with which they are overtaken is beyond their resources. It is, therefore, necessary to store up in youth for the vicissitudes of old age, and on this principle every Friendly Society, worthy of the name, has been founded.

Much has been said of late on the necessarily inherent instability of Friendly Societies, and, on their presumed want of permanence, various suggestions have been



made, by which it is proposed to transfer to the management and responsibility of the Government some of the most important branches of their transactions and benefits. A deal of information is given in pp. 408-530 on the various circumstances which influence the permanence of Friendly Societies. A patient perusal of those pages will distinctly shew that there is no institution of the day connected with the social progress of society which can be regarded, in a financial sense, so safe and permanent in its character as a Friendly Society, conducted on the principles therein pointed out, and now fully recognised by every one experienced in the management of this class of Provident Associations, conclusively proving that they offer the most undoubted security which can be conceived for the fulfilment of their engagements, their duration, and their permanence. It is believed impossible to point out a single instance in any part of the country whatever of the failure of a Friendly Society in which one or all of those conditions of stability and safety have not been violated.

These conditions may be briefly recited.

In the first place it is necessary, as fully shewn in pp. 514-21, *seq.* that every society should consist of members sufficiently numerous to realise the average results anticipated in the calculations on which its tables of contributions and benefits are founded. If this principle be not attended to, and the societies are small, the best and most skilful calculations may be insufficient to maintain their solvency. It might happen that rates very much in excess of what might be necessary in a large institution would, owing to adverse fluctuations, be totally inadequate to provide the benefits promised to the members; or, on the other hand, rates that would be ruinously low in a society of considerable magnitude, might, from the prevalence of favourable ratios of sickness and mortality, prove quite ample, and even leave a surplus in a society of a limited number of members. This case is exceedingly well put in the Report of the Preston District Sick Union (*see* pp. 515-19, *seq.*), and the various Quarterly Reports of the G. M. and Board of Directors also contain frequent allusions to societies breaking down or closing owing to adverse results from small numbers, while others, in which little sickness has been experienced, from the avarice and cupidity of the members, inducing them to pocket the Surplus Funds. In the Report for April, 1855, it is stated that—"Those who have paid  
 " attention to the average rate of sickness, when the experience of few members has been  
 " obtained, must have been struck with the very large ratio in some instances experienced,  
 " in other instances with the small rate of average sickness, and, when it is considered the  
 " number of lodges in the Unity having few members, it is surprising that more lodges are  
 " not compelled to close, by experiencing far more than the average rate of sickness.  
 " During the year 1854, twenty lodges have joined other lodges; thus, instead of existing  
 " as forty separate and distinct lodges, they only form twenty lodges in number, and  
 " causing the number of lodges in the Unity to be diminished by twenty." "Many of



“ the lodges that have been closed, during the year 1854, have had considerably less than  
 “ the average amount of sickness amongst their members, and this for a considerable  
 “ period of time, and which has enabled many of them to realise funds of £.10 per  
 “ member, others more, and one as high as £.25 per member; in some few other  
 “ instances they have experienced more than the average sickness, and their funds have  
 “ been reduced; one lodge only closing for want of funds to pay their sick members.  
 “ When it is seen that twenty lodges, containing 539 members, have closed during the  
 “ year, it will be very apparent, that with the average number of members forming these  
 “ lodges, that when one or two members fall sick, in so few a number, their funds must  
 “ soon become exhausted.” In fact, unless the number of members in a society be  
 considerable, there can be no security for its stability, however great the skill and  
 judgment exercised in its management in other respects. Inattention, therefore, to this  
 one element is of itself sufficient to produce failure in Friendly Societies.

In the second place, as pointed out in pp. 439 and 527, a periodical investigation  
 should be instituted into the state of the society's affairs. Such periodical inquiries would  
 afford the means of correcting any misconceptions which may have existed either at their  
 formation or at any subsequent stage of their progress, in respect to the rate of sickness  
 and mortality to which they are presumed to be liable; and the actual experience of each  
 society would thus be brought to bear upon the financial adjustment of its assets and  
 liabilities. These investigations should be made at not greater intervals than five years.  
 One great mistake often made by the promoters and managers of small societies, is that  
 they conceive if a particular society is eminently successful under a given scale of  
 contributions and benefits, that those who are residing in another district, and living  
 under different influences, cannot do better than follow the example of their neighbours  
 in the adjustment of the contributions and benefits. This impression is natural enough;  
 but no conclusion has of late years been better established by practical research than the  
 fact of the great disparity which exists between the ratios of sickness among societies  
 established even in adjacent districts. This has been fully shewn in pp. 408-68, even  
 when the number of members in the societies is sufficiently large to realise the average  
 amount of sickness peculiar to the district. Hence, the necessity and the advantage of  
 regulations imposing on societies the duty of periodical investigations into their affairs;  
 for by this means, actual experience, the most valuable of all teachers, is made operative  
 in their future conduct and management. It is well known that in the county of  
 Wilts, (see page 437) large and well-conducted societies have been subject to an  
 unusually low ratio of sickness; that in Somersetshire, other societies, equally well-  
 conducted, have been subject to an unusually high ratio of sickness; while in the  
 intermediate districts of Devonshire, the ratio of sickness actually experienced by a large  
 and well-managed society has proved very different from those which prevail in the other



two counties. It will also be found, that comparing the sickness experienced in two agricultural counties, Essex and Hampshire,—that in Essex, the sickness is unusually high; while in Hampshire it is considerably under the average. The causes of these variations are fully discussed in the following contributions. Similar differences will be found to prevail in the experience of societies in different manufacturing towns, examples of which are given in pp. 429–38. Hence, the imperative necessity of periodical investigations, such as those herein suggested, in order to maintain the solvency and permanency of Provident Societies. As already stated, many lodges in the Manchester Unity have recently become alive to the advantages arising from periodical examinations of their assets and liabilities, and so great was the importance attached to these investigations that it was actually rendered compulsory on societies enrolled under the 9 and 10 Vict., c. 27, although unwisely omitted in all the subsequent Acts.

In the third place, there should be a regulation by which every society shall have a separate and distinct account kept of the receipts and disbursements made in respect of each benefit or fund. From the passing of the 8 and 9 Vict., c. 27, this was compulsory on all societies subsequently enrolled, until repealed by the 18 and 19 Vict., c. 63. The advantage of such a regulation is, that if the financial condition of any particular fund or benefit is at fault, the error would be more easily discovered than if the whole receipts and disbursements of the society were kept collectively. It might happen for instance, that while all the other funds of a society were well regulated, so far as their contributions and benefits were concerned, that the sickness benefits were making ruinous inroads on the society's assets; but from the accounts being kept in the aggregate, this evil may not be perceived until it is too late to apply a remedy. If, however, the suggestion here offered had been adopted, it is evident that all such untoward influences would have manifested themselves at a much earlier period, and when corrections could have been in time applied to restore the fund to a healthy and normal condition. Such societies have unfortunately been too often assumed to be in a prosperous condition, from the mere fact of their accumulated capital having kept increasing year after year. But as no portion of the money received for superannuation allowances and other deferred benefits should be touched for a long period of years, this fact was lost sight of in the aggregate system of accounts, and the monies belonging to them too often infringed upon for payments on account of the sickness fund, owing to the inadequacy of its contributions.

It can be abundantly proved, by the citation of numerous well known instances, that many societies would have been saved from ruin and dissolution, by the early adoption of such a rule as the one now suggested; while in many other instances in which the breaking up of societies did not ensue, the hardship of one class of members supporting another, between which there was no common interest, would have been avoided.



The fourth precaution necessary to be observed is never to allow any member to subscribe for a sickness allowance greatly exceeding the average of the benefits allowed to all the members collectively; and never, in any instance, to permit a member to subscribe for a sickness allowance which shall exceed two-thirds or three-fourths of his usual or average earnings while following his ordinary avocations. The enforcement of this condition would form a great protection in the administration of the society's affairs, and maintain a healthy moral tone of action amongst the members. Such a rule simplifies the administration of the sickness benefits, and is conservative of the society by placing the members in a better position in regard to its management. The society's prosperity is greatly promoted by the practice of never admitting any members to subscribe for a greater sickness allowance than will always, irrespective of other conditions, maintain a healthy inducement in the minds of sickness claimants to return to their occupations as soon as they possibly can with safety, rather than linger on the funds. Nothing can be more injurious and detrimental, both to the members and the society, than to permit of sickness allowances being granted that shall closely approximate to the member's earnings. There is scarcely any consideration by which it is possible to justify such a proceeding. The best securities for a society's success would be afforded in the adoption of this regulation.

A careful consideration of the four conditions now urged will shew that their practical effect is to maintain a constant adjustment between the contributions made by the members under all varying circumstances, and the liabilities they entail on the society. Were these four leading principles strictly observed in the management of Friendly Societies, failure is next to impossible. Let them be practically adopted and it is difficult to conceive any human institution more beneficial and permanent.

It is not therefore to be assumed, as has of late been said in various influential quarters, that Friendly Societies are in their nature essentially instable. An attentive consideration of their history will satisfactorily shew the wonder is, that with so little information, until quite recently, of the real nature and extent of their liabilities, more of them have not broken down. It has been too much assumed, by even the educated classes and not a few of those distinguished persons who have identified themselves publicly with the interests of these societies, that at best they were but mere pot-house schemes and temporary expedients as adjuncts to a small parish or congregation, simply calculated to assuage the evils of a day. It has remained for the working classes themselves to demonstrate that their Benefit Societies are capable of accomplishing much beyond this, and those must be indifferent spectators indeed of the social progress amongst the industrious community who cannot clearly discern that through one form or other of these institutions, whether in the shape of the ordinary Friendly and Benefit Society, the Odd Fellow, Foresters, and Druid Lodges, the Rechabite Tents, and other



description of Benefit Clubs, the hard working prudential people of this country have already begun to work out in good earnest their own regeneration and independence. These associations are therefore certain, before long, to become engrafted with all the essential elements of stability and permanence which have just been pointed out.

No doubt Benefit Societies have suffered from many serious evils, but these will be found to have nearly all arisen from ignorance and inexperience. More light, however, has now dawned upon them. Even our Assurance Institutions, which are more simple in principle and much less difficult in management, have been any thing but free from grave objections, but no one attempts in consequence to transfer their business and their responsibilities to the Government of the country. Let us see therefore the merits of the proposal made, on the plea of the insecurity of Friendly Societies, that the working people of this country should purchase deferred annuities and pensions from the Government, under the 16th and 17th Vict., cap. 45.

Apart from the objection so often urged, that the people have always shewn a great aversion to have any dealings in connection with their Benefit Clubs with the Government, and hence the immense multitude, hitherto, of unenrolled societies, and the striking failure of the corresponding attempt to sell Government Annuities to them under the 3rd William IV., cap. 14. It is of the first importance that the fact of this failure on the part of the Government should be thoroughly understood, especially by those now endeavouring to ingratiate into the favour of the people the recent Annuity Act. Great efforts were originally made by the Government officials to render the scheme successful. It was arranged that through the medium of savings banks such annuities could be purchased, and that in any parish or place in the United Kingdom where no savings bank was legally established, it was lawful to establish a society for carrying the provisions of the Act into execution, and that annuities of not less than £.4 nor more than £.30 per annum, might be secured, and the annuities might be either "immediate," "deferred," or "temporary annuities for a certain number of years." In this latter respect the former Act was more comprehensive than the recent one. Provision was also made that the consideration money for the annuities may be paid either in one sum in the first instance, or by weekly, monthly, quarterly, or yearly instalments, as may suit the convenience of the purchaser. In this respect also the former Act had an advantage over the present one, for it was provided, that if the contract were for a deferred annuity, to be purchased by annual payments, such annual payments must be made to the Commissioners yearly, although for the convenience of the purchaser the money might be received from him by the manager in weekly, monthly, or other instalments. The recent Act repeals the former one and contains no such provision. To the working man the existing Act is further inconvenient, as the fractional parts of one pound of annuity will not be granted, whereas this rule was in the former one limited to the fractional part of



sixpence. It will likewise be found that the annuities were granted on more liberal terms under the 3rd William IV., cap. 14, than under the recent Act, 16th and 17th Vict., cap. 45.

The following shews the terms required to secure an annuity of £.20 per annum, or not quite eight shillings weekly, according to each Act.

| Age at Purchase. | Purchase Money of Annuity deferred 25 Years. |                            |          |          |                       |                            |                    |          |           |  |  | Age at Purchase. |
|------------------|----------------------------------------------|----------------------------|----------|----------|-----------------------|----------------------------|--------------------|----------|-----------|--|--|------------------|
|                  | By Single Payment.                           |                            |          |          |                       |                            | By Yearly Payment. |          |           |  |  |                  |
|                  | 3rd Wm. IV.<br>c. 14.                        | 16th and 17th Vict. c. 45. |          |          | 3rd Wm. IV.<br>c. 14. | 16th and 17th Vict. c. 45. |                    |          |           |  |  |                  |
|                  | Both Sexes.                                  | Males.                     | Females. |          | Both Sexes.           | Males.                     | Females.           |          |           |  |  |                  |
|                  | £. s. d.                                     | £. s. d.                   | £. s. d. | £. s. d. | £. s. d.              | £. s. d.                   | £. s. d.           | £. s. d. |           |  |  |                  |
| 20 to 21         | 114 11 6                                     | 137 0 0                    | 152 13 4 | 6 14 6   | 7 13 4                | 8 11 8                     |                    |          | 20 to 21  |  |  |                  |
| 30 ... 31        | 91 13 0                                      | 108 6 8                    | 126 3 4  | 5 7 6    | 6 1 8                 | 7 1 8                      |                    |          | 30 ... 31 |  |  |                  |
| 40 ... 41        | 68 8 0                                       | 80 0 0                     | 93 8 4   | 4 0 0    | 4 10 0                | 5 5 0                      |                    |          | 40 ... 41 |  |  |                  |
| 50 ... 51        | 45 10 0                                      | 52 11 8                    | 60 18 4  | 2 13 6   | 3 0 0                 | 3 8 4                      |                    |          | 50 ... 51 |  |  |                  |

It will be thus seen, that under the former Act the annuities were granted on much more favourable terms. In the above examples, the recent Act exacts an increase on the purchase money, by single payment of 18·053 per cent. in the case of males, and of no less than 35·312 per cent. for females; while the increase by annual payments amounts in the case of males to 13·182 per cent., and in that of females to 29·603 per cent.

Taking all these matters into account, it is evident that the present Act offers very inferior inducements to annuitants than that which has been repealed; but notwithstanding, the former Act, after having been in force for twenty years, entirely failed in the accomplishment of the object intended by its enactment. It is stated that in the whole of that period, only 2043 members have availed themselves of its provisions. The fact is, the members of Benefit Clubs have a strong, and it may be said in this instance, a well and justly conceived dislike to Government interference in such matters. Were there no other reason than the delay and annoyance to which working men, or the societies representing them, would be put by the circumlocutory formula through which all such transactions must necessarily pass, whenever undertaken by the Government of the country, there would be sufficient reason to render the operations of the Act unpopular and therefore unsuccessful. But there are still more formidable reasons to be advanced against it. Deferred annuities constitute one of the class of benefits for which provision can be more successfully made by Friendly Societies than any other. In the first place,



an examination into the state and condition of health is unnecessary, for if the annuitant's health be bad, that is in favour of the society. In the second place, the administration of the benefit is one of the most simple: it does not require the constant watching and medical scrutiny and skill necessary in the administration of the sickness benefits. And in the third place, the financial operations connected with it are also of the simplest kind possible. In the management of the sickness and death allowance benefits, a portion of the funds must be always kept on hand, or at immediate call, to meet the constantly occurring claims, and the consequence is, that unless a calculation be entered into, on the plan recommended in pp. xxxviii and xxxix, *ante*, to be made quinquennially, it is impossible to tell with any precision whether undue inroads are being made on the funds of those benefits or not. In regard however to deferred annuities, the case is very different, for every farthing in the shape of contributions must be husbanded and improved at interest, and remain untouched until the time arrives which is fixed for the annuitant to receive his pension; and even then, unlike the case of the sickness benefit, nothing more is needed to be established than the fact of his identity. All the trouble of visitation and medical scrutiny, to determine whether the sickness is feigned or otherwise, is unnecessary. The system of accounts and the whole management are therefore as simple as possible. It is, in consequence, difficult to conceive how any disaster could befall this branch of a society's affairs, always supposing the management subject to such of the four conditions, already mentioned, as may affect it. This statement is not a mere speculative opinion, for while the failure of so many sickness clubs has to be lamented, a great number of annuity societies, established even when such matters were but imperfectly understood, can be pointed to as having been eminently successful; with periodical examinations of their affairs, it is next to impossible to conceive how, especially at the present time, when the laws of mortality are so much better understood, that it could be otherwise.

But in pp. 524-6 other important reasons are given why Sickness Societies should grant Deferred Annuities. The proper introduction of annuity schemes into Friendly Societies, and particularly into large societies, such as the Christian Mutual Provident, the Western Provident, and all other large and county societies, which extend over considerable districts, as well as a gigantic institution like the Manchester Unity, would possess advantages of a high and important character in equalising the risks of different districts and occupations, and enabling the societies to adopt something like uniform scales of contributions and benefits by which the liabilities from sickness and annuities shall have a constant corrective influence on each other.

Independent, however, of the attempt to engraft the recent Annuity Act on Benefit Societies, and thereby disturb the peaceful and improving condition which, for several years, in spite of many disturbing influences, they have been gradually assuming, it



cannot be denied that, in respect to them there has been a great deal of over-legislation. A curious and somewhat amusing proof of this will be obtained by a perusal of pp. 8-36 of the Appendix to the First Report of the Registrar of Friendly Societies in England. It will be found that between 1793 and 1855 no less than twenty-three Acts have been passed affecting them; and in the ten years, 1846-55, as many as ten Acts, or one per annum. To know how instable the legislative opinion is on such matters, the Analysis of the 9 and 10 Vict. c. 27, 13 and 14 Vict. c. 115, and 18 and 19 Vict. c. 63, will well repay a perusal. The constant change of object, scope, and privilege, under these three Acts has done much to retard the development of the larger and better conducted class of Friendly Societies, established within the last few years.

It is hoped the present publication, by giving new assurance to the whole class of provident institutions, will, in some measure, counteract this influence, and give a fresh impetus to their progress. The evident tendency in the minds of public men at the present time is to a conviction that the working people can, by legislative processes, be constrained impulsively to the adoption of prudential and saving habits. No mistake, however, is more fatal to the success of the institutions themselves. All that is needed to be done is, to enable the members of them, as between themselves, and also as between them and third parties, to sue and be sued, in a cheap and expeditious manner, and leave all the rest to themselves. Their experience, judgment, interest, and tact, will soon discover the most beneficial modes of management, without Government patronage or supervision. The members of Friendly Societies in this country form a much more important class socially, intellectually, and politically, than is generally supposed. To strengthen those habits of prudence and forethought, which they already manifest to a considerable extent is a work of time, a gradual process, almost entirely dependent on themselves. Calm deliberation can alone help them, and it is trusted that the large amount of information now submitted for their help and guidance in the management of their societies will aid to bring about that happy consummation of their interests which even those of wealth and exalted station may behold with pleasure, saying—

*“ Quam bonum et jucundum est habitare fratres in unum.”*

THE PEOPLE'S PROVIDENT SOCIETY,

2, WATERLOO PLACE, LONDON,

24th February, 1857.



## DURATION OF LIFE IN ENGLAND AND WALES.

THE best record of the General Mortality in England and Wales is contained in the Annual Reports of the Registrar General. So far as relates to the number of deaths in the entire community, more complete returns could not be hoped for.

The 5th Report of the Registrar General contains a table of the Expectation of Life, calculated on the mortality of the year 1841. The census of the population having been taken in that year, offered a ready means to determine the value of life for that period; but as the results of the mortality for several years would undoubtedly form a broader and more satisfactory basis on which to found a measure of the duration of life in this country, it is proposed to calculate a table on the 2nd, 3rd, 4th, and 5th Reports of the Registrar General; omitting the 1st Report, that any imperfections incidental to the early management of the Registers may be avoided. It is evidently necessary to ascertain the exact amount of population living at various ages in the country, during the periods of time to which the returns of deaths relate, before results can be obtained, shewing the ratio of the population dying at the respective ages.

Previous to the population being calculated for the mean time of each period embraced in the 2nd, 3rd, 4th, and 5th Reports, it will be necessary to apply a correction to the enumeration of the population at the period of the Census.

In 1841, the ages of 35,408 males and 11,472 females, or .456 per cent. of the one, and .141 per cent. of the other, were not given. In the registration of deaths, the ages of a certain proportion are also omitted; and if the ratio were the same in both cases, those whose ages were not specified might be left out, as the omission of the one would be corrected by the omission of the other; but it happens that, in the returns of deaths over the entire four years referred to, the number of males whose ages were not specified



was only 1,650, or .235 per cent. of the whole; and of females 896, or only .132 per cent. of the whole female deaths. Independent corrections will, therefore, have to be applied to each class of results.

Let  $a$  = population whose ages were ascertained,

$b$  = total population, and

$x$  = the number enumerated at any particular period of life; and let

$\lambda b - \lambda a = \lambda y$ , then

$\lambda y + \lambda x = \log.$  of the actual number alive at the period of life  $x$ , provided the age of every person had been ascertained.

This correction having been made for the unenumerated ages in the respective censuses of 1821 and 1841, the results obtained form the 2nd, 3rd, 5th, and 6th columns of TABLE A.

TABLE A.

Corrected Enumeration of the Population of England and Wales for 1821 and 1841; with the Annual Rate of Increase during the Intermediate Period.

| Ages.            | MALES.              |                     |                             | FEMALES.            |                     |                             | Ages.            |
|------------------|---------------------|---------------------|-----------------------------|---------------------|---------------------|-----------------------------|------------------|
|                  | Population<br>1821. | Population<br>1841. | Annual Rate<br>of Increase. | Population<br>1821. | Population<br>1841. | Annual Rate<br>of Increase. |                  |
| Under 5          | 898324              | 1047502             | 1.007711                    | 884866              | 1057926             | 1.00897                     | Under 5          |
| 5 ... 10         | 787426              | 952437              | 1.00955                     | 779516              | 951687              | 1.01002                     | 5 ... 10         |
| 10 ... 15        | 685011              | 879732              | 1.01258                     | 650342              | 851649              | 1.01357                     | 10 ... 15        |
| 15 ... 20        | 578304              | 780967              | 1.01513                     | 611741              | 805090              | 1.01382                     | 15 ... 20        |
| 20 ... 30        | 857697              | 1333088             | 1.02229                     | 1029526             | 1498751             | 1.01895                     | 20 ... 30        |
| 30 ... 40        | 673718              | 999000              | 1.01989                     | 741881              | 1051505             | 1.01759                     | 30 ... 40        |
| 40 ... 50        | 547372              | 748487              | 1.01577                     | 572227              | 777500              | 1.01544                     | 40 ... 50        |
| 50 ... 60        | 388351              | 496475              | 1.01235                     | 402245              | 529274              | 1.01381                     | 50 ... 60        |
| 60 ... 70        | 262728              | 329563              | 1.01039                     | 284624              | 369498              | 1.01313                     | 60 ... 70        |
| 70 ... 80        | 130544              | 159551              | 1.01008                     | 142366              | 184468              | 1.01303                     | 70 ... 80        |
| 80 ... 90        | 33577               | 41224               | 1.01031                     | 41480               | 53164               | 1.01248                     | 80 ... 90        |
| 90 ... 100       | 2556                | 2986                | 1.00776                     | 3747                | 4967                | 1.01420                     | 90 ... 100       |
| 100 and upwards. | 68                  | 82                  | 1.00956                     | 148                 | 167                 | 1.00628                     | 100 and upwards. |
| Total .....      | 5845676             | 7771094             | 1.01415                     | 6144709             | 8135647             | 1.01530                     | Total.           |

The 2nd, 3rd, and 4th Reports of the Registrar General gave the number of deaths in the year preceding the 30th June, 1839, 1840, and 1841 respectively; and the 5th Report gave the deaths for the year ending 31st December, 1841. The next step required was to determine the population alive at various ages for the mean time of each of the given periods, that is, the population at the various terms of life in England and Wales on the 31st of December, 1838, 1839, 1840, and 30th June, 1841; and the following method was employed:



$\lambda\pi + \left(\frac{\lambda\pi - \lambda\beta}{20}\right)\theta = \log.$  of the population at the given term of life for the mean time of the period required, in which

$\beta$  = the corrected population at the given age on the day of the Census in 1821,

$\pi$  = the same for 1841, and

$\theta$  = the period elapsed in years and days between the given period and the day of the Census in 1841.

The population for each of the periods being obtained in this manner for every term of life, the combined results form columns 2nd and 5th of TABLE B.

It might have been deemed sufficient to have made the expression  $\frac{\text{Log. } \pi - \text{log. } \beta}{20}$  represent the rate of increase on the general population for all ages; but a glance at columns 4 and 7 of TABLE A will shew the necessity of obtaining an independent value to this expression for each term of life; for, by adopting  $\frac{\text{Log. } \pi - \text{log. } \beta}{20}$  as the rate of increase for every term of life, it would have produced a difference in the male population at ages 20 to 30 of 42108 in TABLE B, or, in other words, an apparent decrease of mortality at that term of life; and consequently, at some other terms, opposite errors in the results would be produced.

Corrections, precisely similar to those applied to the enumeration of the population, were made on the registration of deaths; and the final results for the four years referred to are given in columns 3rd and 6th of TABLE B.

It may be observed here, that as the deaths happening in the last half of the year forming the fourth period of the Registrar General, and those taking place in the first half of the year forming its fifth period, are identical, they will of course be included twice in the results now referred to; but as the population has also been taken for the mean of both periods or years, the proper relation is maintained between the population and deaths.

The preceding step was rendered necessary, from the Registrar General having changed the period for his Annual Report from the 30th June to the 31st December, without having, at the time of making the change, distinguished the deaths belonging to each half year.

All the preceding corrections having been applied to the population and deaths, the combined results form TABLE B, the 4th and 7th columns of which shew the mortality per cent. at the various terms of life for each sex in England and Wales during the four years referred to, and under that form constitute a complete measure of the value of life, during the same period, in the general population of this country.



TABLE B.

ENGLAND and WALES.—Total of the Population as calculated for the 31st December in the years 1838, 1839, 1840, and 30th June, 1841; with the Sum of the Corrected Deaths for the corresponding years as given in the 2nd, 3rd, 4th, and 5th Reports of the Registrar General; and the Mortality per cent. during that period.

| Ages.            | MALES.      |         |                     | FEMALES.    |         |                     | Ages.            |
|------------------|-------------|---------|---------------------|-------------|---------|---------------------|------------------|
|                  | Population. | Deaths. | Mortality per Cent. | Population. | Deaths. | Mortality per Cent. |                  |
| Under 5          | 4156265     | 292968  | 7.048               | 4192129     | 254170  | 6.063               | Under 5          |
| 5 ... 10         | 3771901     | 36588   | .970                | 3767019     | 35494   | .942                | 5 ... 10         |
| 10 ... 15        | 3473008     | 18199   | .524                | 3358717     | 19175   | .570                | 10 ... 15        |
| 15 ... 20        | 3075023     | 22464   | .730                | 3174272     | 26003   | .819                | 15 ... 20        |
| 20 ... 30        | 5210180     | 50765   | .974                | 5878257     | 56298   | .957                | 20 ... 30        |
| 30 ... 40        | 3914433     | 43451   | 1.110               | 4129820     | 47174   | 1.142               | 30 ... 40        |
| 40 ... 50        | 2945219     | 42770   | 1.452               | 3060397     | 40781   | 1.332               | 40 ... 50        |
| 50 ... 60        | 1960445     | 44196   | 2.254               | 2086819     | 40593   | 1.944               | 50 ... 60        |
| 60 ... 70        | 1302647     | 55491   | 4.259               | 1457878     | 54414   | 3.732               | 60 ... 70        |
| 70 ... 80        | 631509      | 57449   | 9.097               | 727904      | 60229   | 8.274               | 70 ... 80        |
| 80 ... 90        | 163089      | 32461   | 19.904              | 209902      | 38064   | 18.134              | 80 ... 90        |
| 90 ... 100       | 11846       | 4282    | 36.316              | 19568       | 6650    | 33.984              | 90 ... 100       |
| 100 and upwards. | 325         | 137     | 42.154              | 662         | 311     | 47.277              | 100 and upwards. |
| Total .....      | 30615890    | 701221  | 2.290               | 32063344    | 679356  | 2.119               | Total.           |

The results now described in columns 4th and 7th of TABLE B, were made to represent the rate of mortality at the mean age of that period of life opposite to which they are placed; intermediate terms were then found by the method of third differences, as fully explained in a subsequent portion of this contribution, and the whole was subsequently corrected as follows:

Let  $\delta_1$  represent the first term;

$\delta_2$  ... second;

$\delta_3$  ... third;

$\delta_n$  ... the  $n^{\text{th}}$  term; then

$$\frac{\delta_1 + \delta_2 + \delta_3 + \delta_4 + \delta_5}{5} = \delta_3$$

$$\frac{\delta_2 + \delta_3 + \delta_4 + \delta_5 + \delta_6}{5} = \delta_4 \quad \text{And}$$

$$\frac{\delta_{n-4} + \delta_{n-3} + \delta_{n-2} + \delta_{n-1} + \delta_n}{5} = \delta_{n-2}$$

The adjusted results thus obtained form columns 4 and 9 of Table C, and may be considered a fair expression of the rate of mortality at the respective ages opposite to which they are placed in the Table. Columns 2nd and 3rd, 7th and 8th in the same Table, shew, out of 100,000 persons attaining the age of ten years, the number living to each subsequent year of life, and also the numbers dying in each successive year of life. Columns

[5 and 10



TABLE C.  
ENGLAND AND WALES.

| Age. | MALES.  |        |                     |                     | Age. | FEMALES. |        |                     |                     | Age. |
|------|---------|--------|---------------------|---------------------|------|----------|--------|---------------------|---------------------|------|
|      | Living. | Dying. | Mortality per Cent. | Specific Intensity. |      | Living.  | Dying. | Mortality per Cent. | Specific Intensity. |      |
| 10   | 100000  | 791    | ·791                | 126·422             | 10   | 100000   | 792    | ·792                | 126·263             | 10   |
| 11   | 99209   | 696    | ·702                | 142·450             | 11   | 99208    | 712    | ·718                | 139·276             | 11   |
| 12   | 98513   | 624    | ·633                | 157·978             | 12   | 98496    | 653    | ·663                | 150·830             | 12   |
| 13   | 97889   | 576    | ·588                | 170·068             | 13   | 97843    | 618    | ·632                | 158·228             | 13   |
| 14   | 97313   | 555    | ·570                | 175·439             | 14   | 97225    | 610    | ·627                | 159·490             | 14   |
| 15   | 96758   | 562    | ·581                | 172·117             | 15   | 96615    | 627    | ·649                | 154·083             | 15   |
| 16   | 96196   | 598    | ·622                | 160·772             | 16   | 95988    | 671    | ·699                | 143·062             | 16   |
| 17   | 95598   | 636    | ·665                | 150·376             | 17   | 95317    | 710    | ·745                | 134·228             | 17   |
| 18   | 94962   | 673    | ·709                | 141·044             | 18   | 94607    | 744    | ·786                | 127·227             | 18   |
| 19   | 94289   | 706    | ·749                | 133·511             | 19   | 93863    | 769    | ·819                | 122·100             | 19   |
| 20   | 93583   | 734    | ·784                | 127·551             | 20   | 93094    | 786    | ·844                | 118·483             | 20   |
| 21   | 92849   | 757    | ·815                | 122·699             | 21   | 92308    | 794    | ·860                | 116·279             | 21   |
| 22   | 92092   | 778    | ·845                | 118·343             | 22   | 91514    | 804    | ·879                | 113·766             | 22   |
| 23   | 91314   | 800    | ·876                | 114·155             | 23   | 90710    | 815    | ·898                | 111·359             | 23   |
| 24   | 90514   | 822    | ·908                | 110·132             | 24   | 89895    | 825    | ·918                | 108·933             | 24   |
| 25   | 89692   | 840    | ·937                | 106·724             | 25   | 89070    | 835    | ·937                | 106·724             | 25   |
| 26   | 88852   | 853    | ·960                | 104·167             | 26   | 88235    | 845    | ·958                | 104·384             | 26   |
| 27   | 87999   | 863    | ·981                | 101·937             | 27   | 87390    | 854    | ·977                | 102·354             | 27   |
| 28   | 87136   | 870    | ·998                | 100·200             | 28   | 86536    | 863    | ·997                | 100·301             | 28   |
| 29   | 86266   | 872    | 1·011               | 98·912              | 29   | 85673    | 870    | 1·016               | 98·425              | 29   |
| 30   | 85394   | 874    | 1·023               | 97·752              | 30   | 84803    | 878    | 1·035               | 96·618              | 30   |
| 31   | 84520   | 876    | 1·036               | 96·525              | 31   | 83925    | 884    | 1·053               | 94·967              | 31   |
| 32   | 83644   | 877    | 1·049               | 95·329              | 32   | 83041    | 891    | 1·073               | 93·197              | 32   |
| 33   | 82767   | 880    | 1·063               | 94·073              | 33   | 82150    | 895    | 1·089               | 91·827              | 33   |
| 34   | 81887   | 883    | 1·078               | 92·764              | 34   | 81255    | 900    | 1·108               | 90·253              | 34   |
| 35   | 81004   | 887    | 1·095               | 91·324              | 35   | 80355    | 902    | 1·123               | 89·047              | 35   |
| 36   | 80117   | 892    | 1·113               | 89·847              | 36   | 79453    | 904    | 1·138               | 87·873              | 36   |
| 37   | 79225   | 898    | 1·134               | 88·183              | 37   | 78549    | 906    | 1·153               | 86·730              | 37   |
| 38   | 78327   | 906    | 1·157               | 86·430              | 38   | 77643    | 906    | 1·167               | 85·690              | 38   |
| 39   | 77421   | 917    | 1·184               | 84·459              | 39   | 76737    | 906    | 1·181               | 84·674              | 39   |
| 40   | 76504   | 927    | 1·212               | 82·508              | 40   | 75831    | 906    | 1·195               | 83·682              | 40   |
| 41   | 75577   | 941    | 1·245               | 80·321              | 41   | 74925    | 908    | 1·212               | 82·508              | 41   |
| 42   | 74636   | 955    | 1·279               | 78·186              | 42   | 74017    | 911    | 1·231               | 81·235              | 42   |
| 43   | 73681   | 972    | 1·319               | 75·815              | 43   | 73106    | 916    | 1·253               | 79·808              | 43   |
| 44   | 72709   | 990    | 1·362               | 73·421              | 44   | 72190    | 923    | 1·279               | 78·186              | 44   |
| 45   | 71719   | 1009   | 1·407               | 71·073              | 45   | 71267    | 931    | 1·306               | 76·570              | 45   |
| 46   | 70710   | 1028   | 1·454               | 68·776              | 46   | 70336    | 940    | 1·336               | 74·850              | 46   |
| 47   | 69682   | 1049   | 1·506               | 66·401              | 47   | 69396    | 953    | 1·373               | 72·833              | 47   |
| 48   | 68633   | 1071   | 1·560               | 64·103              | 48   | 68443    | 966    | 1·411               | 70·872              | 48   |
| 49   | 67562   | 1095   | 1·621               | 61·690              | 49   | 67477    | 982    | 1·455               | 68·729              | 49   |
| 50   | 66467   | 1120   | 1·685               | 59·347              | 50   | 66495    | 999    | 1·502               | 66·578              | 50   |
| 51   | 65347   | 1151   | 1·760               | 56·818              | 51   | 65496    | 1020   | 1·557               | 64·226              | 51   |
| 52   | 64196   | 1183   | 1·843               | 54·259              | 52   | 64476    | 1043   | 1·618               | 61·805              | 52   |
| 53   | 63013   | 1219   | 1·935               | 51·680              | 53   | 63433    | 1072   | 1·690               | 59·172              | 53   |
| 54   | 61794   | 1258   | 2·036               | 49·116              | 54   | 62361    | 1102   | 1·767               | 56·593              | 54   |
| 55   | 60536   | 1299   | 2·146               | 46·598              | 55   | 61259    | 1143   | 1·866               | 53·591              | 55   |
| 56   | 59237   | 1339   | 2·260               | 44·248              | 56   | 60116    | 1192   | 1·983               | 50·429              | 56   |
| 57   | 57898   | 1386   | 2·394               | 41·771              | 57   | 58924    | 1237   | 2·099               | 47·642              | 57   |
| 58   | 56512   | 1429   | 2·529               | 39·541              | 58   | 57687    | 1277   | 2·214               | 45·167              | 58   |



TABLE C.—(continued.)

ENGLAND AND WALES.

| Age. | MALES.  |        |                     |                     | Age. | FEMALES. |        |                     |                     | Age. |
|------|---------|--------|---------------------|---------------------|------|----------|--------|---------------------|---------------------|------|
|      | Living. | Dying. | Mortality per Cent. | Specific Intensity. |      | Living.  | Dying. | Mortality per Cent. | Specific Intensity. |      |
| 59   | 55083   | 1478   | 2.683               | 37.272              | 59   | 56410    | 1325   | 2.349               | 42.571              | 59   |
| 60   | 53605   | 1527   | 2.849               | 35.100              | 60   | 55085    | 1365   | 2.478               | 40.355              | 60   |
| 61   | 52078   | 1583   | 3.040               | 32.895              | 61   | 53720    | 1410   | 2.625               | 38.095              | 61   |
| 62   | 50495   | 1637   | 3.242               | 30.845              | 62   | 52310    | 1463   | 2.797               | 35.753              | 62   |
| 63   | 48858   | 1697   | 3.474               | 28.785              | 63   | 50847    | 1529   | 3.007               | 33.256              | 63   |
| 64   | 47161   | 1754   | 3.719               | 26.889              | 64   | 49318    | 1594   | 3.232               | 30.941              | 64   |
| 65   | 45407   | 1815   | 3.997               | 25.019              | 65   | 47724    | 1666   | 3.491               | 28.645              | 65   |
| 66   | 43592   | 1868   | 4.285               | 23.337              | 66   | 46058    | 1732   | 3.760               | 26.596              | 66   |
| 67   | 41724   | 1923   | 4.609               | 21.697              | 67   | 44326    | 1801   | 4.063               | 24.612              | 67   |
| 68   | 39801   | 1969   | 4.947               | 20.214              | 68   | 42525    | 1863   | 4.381               | 22.826              | 68   |
| 69   | 37832   | 2016   | 5.328               | 18.769              | 69   | 40662    | 1929   | 4.744               | 21.079              | 69   |
| 70   | 35816   | 2054   | 5.735               | 17.437              | 70   | 38733    | 1985   | 5.125               | 19.512              | 70   |
| 71   | 33762   | 2092   | 6.197               | 16.137              | 71   | 36748    | 2044   | 5.562               | 17.979              | 71   |
| 72   | 31670   | 2118   | 6.688               | 14.952              | 72   | 34704    | 2090   | 6.022               | 16.606              | 72   |
| 73   | 29552   | 2141   | 7.245               | 13.803              | 73   | 32614    | 2134   | 6.543               | 15.284              | 73   |
| 74   | 27411   | 2146   | 7.829               | 12.773              | 74   | 30480    | 2161   | 7.090               | 14.104              | 74   |
| 75   | 25265   | 2148   | 8.502               | 11.762              | 75   | 28319    | 2183   | 7.709               | 12.972              | 75   |
| 76   | 23117   | 2131   | 9.218               | 10.848              | 76   | 26136    | 2187   | 8.368               | 11.950              | 76   |
| 77   | 20986   | 2107   | 10.040              | 9.960               | 77   | 23949    | 2180   | 9.103               | 10.985              | 77   |
| 78   | 18879   | 2062   | 10.922              | 9.156               | 78   | 21769    | 2149   | 9.872               | 10.130              | 78   |
| 79   | 16817   | 2001   | 11.899              | 8.404               | 79   | 19620    | 2105   | 10.729              | 9.321               | 79   |
| 80   | 14816   | 1910   | 12.891              | 7.757               | 80   | 17515    | 2035   | 11.619              | 8.607               | 80   |
| 81   | 12906   | 1803   | 13.970              | 7.158               | 81   | 15480    | 1948   | 12.584              | 7.947               | 81   |
| 82   | 11103   | 1672   | 15.059              | 6.640               | 82   | 13532    | 1838   | 13.580              | 7.364               | 82   |
| 83   | 9431    | 1528   | 16.202              | 6.172               | 83   | 11694    | 1716   | 14.674              | 6.815               | 83   |
| 84   | 7903    | 1375   | 17.399              | 5.747               | 84   | 9978     | 1575   | 15.785              | 6.335               | 84   |
| 85   | 6528    | 1222   | 18.719              | 5.342               | 85   | 8403     | 1430   | 17.018              | 5.876               | 85   |
| 86   | 5306    | 1066   | 20.090              | 4.977               | 86   | 6973     | 1277   | 18.313              | 5.461               | 86   |
| 87   | 4240    | 923    | 21.769              | 4.594               | 87   | 5696     | 1123   | 19.716              | 5.072               | 87   |
| 88   | 3317    | 766    | 23.093              | 4.330               | 88   | 4573     | 968    | 21.168              | 4.724               | 88   |
| 89   | 2551    | 630    | 24.696              | 4.049               | 89   | 3605     | 819    | 22.718              | 4.402               | 89   |
| 90   | 1921    | 505    | 26.288              | 3.804               | 90   | 2786     | 676    | 24.264              | 4.121               | 90   |
| 91   | 1416    | 395    | 27.895              | 3.585               | 91   | 2110     | 545    | 25.829              | 3.872               | 91   |
| 92   | 1021    | 302    | 29.579              | 3.381               | 92   | 1565     | 429    | 27.412              | 3.648               | 92   |
| 93   | 719     | 224    | 31.154              | 3.210               | 93   | 1136     | 329    | 28.961              | 3.453               | 93   |
| 94   | 495     | 162    | 32.727              | 3.056               | 94   | 807      | 247    | 30.607              | 3.267               | 94   |
| 95   | 333     | 114    | 34.233              | 2.921               | 95   | 560      | 180    | 32.143              | 3.111               | 95   |
| 96   | 219     | 78     | 35.616              | 2.808               | 96   | 380      | 128    | 33.684              | 2.969               | 96   |
| 97   | 141     | 52     | 36.879              | 2.712               | 97   | 252      | 89     | 35.317              | 2.832               | 97   |
| 98   | 89      | 33     | 37.079              | 2.697               | 98   | 163      | 60     | 36.810              | 2.717               | 98   |
| 99   | 56      | 21     | 37.500              | 2.667               | 99   | 103      | 39     | 37.864              | 2.641               | 99   |
| 100  | 35      | 14     | 40.000              | 2.500               | 100  | 64       | 25     | 39.062              | 2.560               | 100  |
| 101  | 21      | 8      | 38.095              | 2.625               | 101  | 39       | 16     | 41.026              | 2.438               | 101  |
| 102  | 13      | 5      | 38.461              | 2.600               | 102  | 23       | 10     | 43.478              | 2.300               | 102  |
| 103  | 8       | 3      | 37.500              | 2.667               | 103  | 13       | 6      | 46.154              | 2.167               | 103  |
| 104  | 5       | 2      | 40.000              | 2.500               | 104  | 7        | 3      | 42.857              | 2.333               | 104  |
| 105  | 3       | 2      | 66.667              | 1.500               | 105  | 4        | 2      | 50.000              | 2.000               | 105  |
| 106  | 1       | 1      | 100.000             | 1.000               | 106  | 2        | 1      | 100.000             | 1.000               | 106  |



5 and 10 contain the reciprocals of columns 4 and 9, and represent the specific intensity of life at each age. Male and female life will each be found to attain its highest specific intensity at the age of 14. It will also be seen that male life possesses a much higher specific intensity than female life up to the age of 25 inclusive; from that to the age of 38 the difference is very little, but that generally in favour of male life; and that from 38 upwards to nearly the extreme of life, the scale turns in favour of female life, and the specific intensity is higher throughout. At the age of 50 the two sexes attain their balance, the numbers surviving of each, from the age of 10, being equal. The nature of the specific intensity, in the preceding sense, must be clearly understood to refer to that period of life only to which it is affixed, and not to be any index to the general value of life; for it will be seen that although male life possesses a higher specific intensity up to the age of 38, still female life is of a higher absolute value throughout the whole of the same period.

TABLE D exhibits the Expectation of Life as deduced from the data already described; and without attempting anything like an elaborate comparison between it and other tables, hitherto regarded as a near approximation to the real measure of life, such observations only will be made as appear to be more intimately connected with the subject of this paper.

It is clear that a table formed from the data at present under consideration, will shew the value of life in the country generally; all classes of society, from the highest to the lowest, being included; and it will therefore serve as a useful standard of comparison with the measure of life in individual classes of society, provided the rate of mortality in those classes can be determined.

In order to convey a general idea of the value of life as represented by TABLE D, it may be stated that it gives a greater expectation to males throughout the whole range of the table, than is given in the Table at page XIX. of the 5th Report of the Registrar General:

|                             |    |     |     |                |     |
|-----------------------------|----|-----|-----|----------------|-----|
| At Age 10 the difference is |    |     |     | .68 of a year. |     |
| ...                         | 20 | ... | ... | .81            | ... |
| ...                         | 30 | ... | ... | .97            | ... |
| ...                         | 40 | ... | ... | .92            | ... |
| ...                         | 50 | ... | ... | .83            | ... |
| ...                         | 60 | ... | ... | 1.00           | ... |
| ...                         | 70 | ... | ... | .44            | ... |
| ...                         | 80 | ... | ... | .15            | ... |
| ...                         | 90 | ... | ... | .15            | ... |

In the Twelfth Annual Report of the Registrar-General he has given a new Life Table, designated by him No. 2, the basis of which, in common with that in his Fifth Report, is the population of 1841, but the Mortality extends over the seven years, 1838-44. The results of this Table differ but little from the above.

[The value



TABLE D.

EXPECTATION—ENGLAND AND WALES—*Whole Population.*

| Age. | Males.  | Females. | Age. | Males.  | Females. |
|------|---------|----------|------|---------|----------|
| 10   | 47.7564 | 48.3826  | 59   | 15.1806 | 16.1552  |
| 11   | 47.1332 | 47.7648  | 60   | 14.5854 | 15.5320  |
| 12   | 46.4626 | 47.1065  | 61   | 13.9983 | 14.9137  |
| 13   | 45.7555 | 46.4175  | 62   | 13.4215 | 14.3022  |
| 14   | 45.0234 | 45.7140  | 63   | 12.8544 | 13.6994  |
| 15   | 44.1781 | 44.9950  | 64   | 12.2990 | 13.1086  |
| 16   | 43.5342 | 44.2855  | 65   | 11.7545 | 12.5300  |
| 17   | 42.8034 | 43.5937  | 66   | 11.2230 | 11.9648  |
| 18   | 42.0862 | 42.9171  | 67   | 10.7026 | 11.4128  |
| 19   | 41.3830 | 42.2533  | 68   | 10.1954 | 10.8750  |
| 20   | 40.6910 | 41.5982  | 69   | 9.7000  | 10.3504  |
| 21   | 40.0092 | 40.9482  | 70   | 9.2176  | 9.8409   |
| 22   | 39.3339 | 40.2991  | 71   | 8.7480  | 9.3455   |
| 23   | 38.6652 | 39.6519  | 72   | 8.2927  | 8.8665   |
| 24   | 38.0025 | 39.0068  | 73   | 7.8510  | 8.4026   |
| 25   | 37.3457 | 38.3635  | 74   | 7.4251  | 7.9559   |
| 26   | 36.6946 | 37.7218  | 75   | 7.0131  | 7.5248   |
| 27   | 36.0455 | 37.0817  | 76   | 6.6184  | 7.1116   |
| 28   | 35.3975 | 36.4427  | 77   | 6.2395  | 6.7153   |
| 29   | 34.7494 | 35.8048  | 78   | 5.8802  | 6.3378   |
| 30   | 34.0990 | 35.1671  | 79   | 5.5361  | 5.9772   |
| 31   | 33.4466 | 34.5297  | 80   | 5.2160  | 5.6355   |
| 32   | 32.7916 | 33.8919  | 81   | 4.9094  | 5.3106   |
| 33   | 32.1337 | 33.2541  | 82   | 4.6253  | 5.0031   |
| 34   | 31.4736 | 32.6149  | 83   | 4.3567  | 4.7109   |
| 35   | 30.8120 | 31.9750  | 84   | 4.1025  | 4.4351   |
| 36   | 30.1469 | 31.3312  | 85   | 3.8610  | 4.1726   |
| 37   | 29.4808 | 30.6867  | 86   | 3.6349  | 3.9258   |
| 38   | 28.8130 | 30.0390  | 87   | 3.4212  | 3.6938   |
| 39   | 28.1443 | 29.3877  | 88   | 3.2350  | 3.4781   |
| 40   | 27.4760 | 28.7330  | 89   | 3.0567  | 3.2778   |
| 41   | 26.8065 | 28.0742  | 90   | 2.8930  | 3.0944   |
| 42   | 26.1382 | 27.4125  | 91   | 2.7458  | 2.9256   |
| 43   | 25.4701 | 26.7479  | 92   | 2.6143  | 2.7703   |
| 44   | 24.8039 | 26.0809  | 93   | 2.4986  | 2.6276   |
| 45   | 24.1390 | 25.4120  | 94   | 2.3976  | 2.4950   |
| 46   | 23.4767 | 24.7420  | 95   | 2.3208  | 2.3750   |
| 47   | 22.8156 | 24.0703  | 96   | 2.2727  | 2.2632   |
| 48   | 22.1567 | 23.3985  | 97   | 2.1879  | 2.1587   |
| 49   | 21.4996 | 22.7263  | 98   | 2.1631  | 2.0644   |
| 50   | 20.8463 | 22.0545  | 99   | 2.1379  | 1.9757   |
| 51   | 20.1947 | 21.3834  | 100  | 2.1388  | 1.8750   |
| 52   | 19.5478 | 20.7137  | 101  | 2.0652  | 1.7564   |
| 53   | 18.9050 | 20.5461  | 102  | 2.0715  | 1.6304   |
| 54   | 18.2682 | 19.3821  | 103  | 1.9445  | 1.5000   |
| 55   | 17.6370 | 18.7220  | 104  | 1.6667  | 1.3571   |
| 56   | 17.0128 | 18.0682  | 105  | 1.2500  | 1.0000   |
| 57   | 16.3946 | 17.4236  | 106  | 1.0000  | .5000    |
| 58   | 15.7842 | 16.7865  | 107  | .5000   |          |



The value of Female Life, TABLE D, is also higher than Female Life in the Table of the Registrar General; the difference of Expectation in the two Tables being—

At Age 10 the difference is .57 of a year.

|     |    |     |      |     |
|-----|----|-----|------|-----|
| ... | 20 | ... | .79  | ... |
| ... | 30 | ... | .92  | ... |
| ... | 40 | ... | 1.01 | ... |
| ... | 50 | ... | .98  | ... |
| ... | 60 | ... | 1.12 | ... |
| ... | 70 | ... | .81  | ... |
| ... | 80 | ... | .44  | ... |
| ... | 90 | ... | .32  | ... |

A comparison of the expectation of Male Life in TABLE D with the Carlisle Table, which includes both sexes, will shew a higher value of life in the Carlisle Table up to age 54:

At Age 10 the difference is 1.06 of a year.

|     |    |                       |         |     |
|-----|----|-----------------------|---------|-----|
| ... | 20 | ...                   | .77     | ... |
| ... | 30 | ...                   | .24     | ... |
| ... | 40 | ...                   | .13     | ... |
| ... | 50 | ...                   | .26 and | ... |
| ... | 54 | they nearly coincide. |         |     |

Again, from that age up till 75 the difference is very little, but that generally against the Carlisle Table; and at 75 the Carlisle Table again crosses and maintains a superiority till the extreme of life.

The expectation of Female Life, as shewn in TABLE D, is higher than the expectation of the Carlisle Table after 15 years of age:

At Age 20 the difference being .14 of a year.

|     |    |     |      |     |
|-----|----|-----|------|-----|
| ... | 30 | ... | .83  | ... |
| ... | 40 | ... | 1.12 | ... |
| ... | 50 | ... | .94  | ... |
| ... | 60 | ... | 1.18 | ... |
| ... | 70 | ... | 1.66 | ... |
| ... | 80 | ... | .13  | ... |

... 88 they nearly coincide, and the Carlisle Table continues higher after that age.

A comparison of the mean of the expectation of Male and Female Life in TABLE D, with the expectation of the Carlisle Table, produces the following results, namely,



|             |                                                   |     |            |
|-------------|---------------------------------------------------|-----|------------|
| At Age 10   | the difference in favour of the Carlisle Table is | ·75 | of a year. |
| ... 20      | ... ..                                            | ·32 | ...        |
| ... 30      | the difference in favour of England & Wales is    | ·29 | ...        |
| ... 40      | ... ..                                            | ·49 | ...        |
| ... 50      | ... ..                                            | ·34 | ...        |
| ... 60      | ... ..                                            | ·71 | ...        |
| ... 70      | ... ..                                            | ·35 | ...        |
| Again at 80 | the difference in favour of the Carlisle Table is | ·09 | ...        |
| ... 90      | ... ..                                            | ·29 | ...        |

So that the absolute difference throughout the whole course of both Tables is very small, and the near approximation rather remarkable, considering the very different sources from which the data are derived. For a more minute comparison of those results with several of the best recognised Life Tables, reference is made to the Table in the Appendix, Note I.

Much attention has of late been given to the supposed influence of locality on the duration of life; still no public means have yet been employed to correctly solve the question. For the progress of vital statistics it unfortunately happens, that the public records of this country are kept with very little regard to method or unity of plan. The Report of the Census may certainly in itself be regarded as a very complete document; and perhaps no other country possesses such excellent Mortuary Registers; yet for almost every purpose of exact calculation, both documents are nearly useless. No two things should have been more intimately related in design and classification, than the Census of the People and the Registration of Deaths. Still they seem to have been compiled without any regard to each other. For example, if it were required to compare any two counties in England—a manufacturing with an agricultural county—an inland with a coasting county—in order to determine the relative value of life in the respective populations, it cannot at the present time be done. The Report of the Census Commissioners gives the population for those counties; but on reference to the reports of the Registrar General it is found that the deaths are given for quite a different arrangement of districts. Again, if it be required to compare one district of the Registrar General with another, the same kind of difficulty arises; for, on turning to the Census Report, those districts are in no way recognised. Precisely the same want in unity of plan is to be regretted in respect to the town districts of England, the districts of Census Commissioners constantly differing from those adopted by the Registrar General.

Were these difficulties overcome, it would then be easy to determine the difference of mortality in various districts, in precisely the same manner that the difference of mortality in male and female life has been found in the preceding Table. Another inquiry at least would however still remain, before it could be decided to what extent the difference of mortality was owing to the simple influence or peculiarity of locality itself.

At present it is right to assume, that either employment or occupation—condition in



life, or rank in society—poverty or riches—has as direct an influence on the duration of life, as peculiarity of locality or habitation; for the effect of neither one nor the other of the presumed influencing causes has yet been correctly defined. The truth of this assumption may appear more evident thus:—Suppose that the town of Liverpool were compared with some purely agricultural district, and that a much higher rate of mortality was found to prevail in the former; it would be no more right to assign this result wholly, or indeed any given portion of it, to the badly-conditioned streets and ill-planned houses of Liverpool, than to any other of the supposed causes.

In order to determine the simple influence of locality, like classes in the respective districts must be compared. In a comparison of districts A and B, if it so happened that in A two elements *c* and *d* were found to influence the value of life, while in B one only of those elements existed, the grounds of comparison would evidently be fallacious. Now this is precisely a parallel case to the state of things which exists in comparisons that have frequently been made between the manufacturing towns and the rural districts of England, and between one manufacturing town and another. Causes influencing the duration of life, independent of locality itself, frequently exist in the one, and not in the other; by overlooking which, observers are often led to assign excessive mortality to imaginary causes. If simple elements were compared, errors of this kind would be avoided. Keeping this in view, and referring to the preceding case, let *c* be supposed to represent comfort, and *d* distress. If, comparing comfort in district A with comfort in district B, a greater mortality were found to prevail in the former than in the latter, it would then be right to assume that the remaining elements—ill-ventilated houses, badly-drained streets, and the like—in district A, were not so favourable to life as in district B; but it would have been wrong to draw such a conclusion, had Comfort and Distress in the one district been compared with Comfort only in the other.

It is evident that, in a comparison of the general mortality of any one place with that of another, such errors could not be avoided. It may happen that the prevalence of a particular kind of employment or occupation in the one, which is not common to the other district—but which employment is of an unhealthy nature, or perhaps subject to great fluctuations in prosperity, or probably both combined—may produce an excessive mortality, the cause of which may be attributed to badly-planned dwellings, instead of to poverty and its train of direful consequences.

If it were possible to compare any one class in a given district with the same class under exactly similar circumstances in another district, the only distinction being the difference of district or locality, then it is plain that the influence of locality, if any, would manifest itself.

Again, if different classes of persons in the same locality were compared—for example, those following different employments—the only distinction being difference of employment, then the force of that element, if any, on the duration of life would appear.

In the present paper it is proposed to enter into this question, and to shew if possible



the influence of locality in the manner just described. The effect of employment on health will be treated of, on the present occasion, so far only as may be necessary to solve the question of locality.

About the time of the first edition of this paper going to press, the following correspondence took place with the Registrar-General on a kindred subject to that of the preceding seven paragraphs:—

GENERAL REGISTER OFFICE,  
26th February, 1845.

SIR,

I fear you may think that I am taking a great liberty in thus intruding upon you; but I hope that you will excuse the trouble I am giving you, when you consider that it is for a public object of very considerable importance.

It has been lately suggested to Her Majesty's Government, that more extended abstracts should be annually laid before Parliament relative to the births, deaths, and marriages registered in accordance with 6th and 7th William IV., c. 86; and I have received instructions to make a Report upon the subject to the Secretary of State for the Home Department.

My object in now troubling you, is to request you to turn your attention to this subject, and to favour me with any suggestions that may occur to you with a view to improvement, feeling assured, from your intimate acquaintance with these matters, that I shall not fail to derive assistance from the recommendations with which you may be pleased to favour me.

For the forms in which the particulars are recorded of each birth, death, and marriage, I beg to refer you to Schedules A, B, and C, in the Act of Parliament above alluded to; and in my Fourth, Fifth, and Sixth Annual Reports will be found the abstracts hitherto made and presented to Parliament.

I want information as to the improvements of which the abstracts are, in your opinion, susceptible, as framed from the entries in the Register Books now established by law, in combination with the returns of the population published in the Reports of the Census' Commissioners; and I wish to know what improvements, without involving any very large additional expenditure, you recommend for immediate adoption, as most urgently required.

I will not upon this occasion ask for your aid and advice with respect to alterations, which you may, perhaps, be disposed to recommend, regarding the forms in which the particulars in the original entries should be registered; nor with respect to original alterations which you may consider it advisable to introduce into any future Act of Parliament amending the present Registration Act; nor will I now allude to improvements which you may suggest relative to the particulars which it may be desirable to record in the next census of 1851,—if you will permit me to do so, I will, in another communication, advert to that subject. At present, I wish for your opinion as to the abstracts which it is most important should be annually given to the public, framed from the returns as at present made.

I have the honour to be, SIR,

Your faithful Servant,

F. G. P. NEISON, Esq.,

Medical, &c. Assurance Office,  
25, Pall Mall.

GEORGE GRAHAM,

Registrar-General.



25, PALL MALL,  
22nd March, 1845.

SIR,

In reply to your letter of the 26th ultimo, I beg to suggest a few alterations, which appear to me calculated to improve your Annual Reports as documents of public utility and importance.

In the registration of the "Causes of Death," an improvement would be effected by giving the age at death under each particular disease. This has already been done, to a limited extent, in your Third and Fourth Reports. To determine the value of life in various parts of the county, or in the country generally, it is essential to ascertain the ages at death, and when the progress or extent of any disease is inquired into, it is equally necessary to know the particular terms of life affected by that disease. In some parts of the country, Devon, Suffolk and Norfolk, for example, the population above 60 years of age is about 9 per cent. of the whole; but in Liverpool, Manchester, and Sheffield, the population alive above the same age is about 4.5 per cent., or one-half of the other;—it is therefore plain that apoplexy, or other diseases peculiar to old age, should have a higher ratio to the whole deaths in the former than in the latter, and this would be so, although the ratio of deaths in this disease to the population at given ages were the same; but at the present moment the Medical Inquirer cannot satisfy himself on this point, as the ages at death are not given.

Again, in the district of St. George's, Hanover Square, 36 per cent. of the population is between 15 and 30 years of age; but in Bethnal Green, 26 per cent. only is alive between those ages;—it is therefore evident that the deaths from consumption and other diseases prevalent at that term of life should also be in the same ratio, but if found in a different ratio there should be some means to account for the greater prevalence of the disease in one place than the other; however, as the ages under the head "Cause of Death" are not specified, it is at present impossible to carry out such an inquiry.

It will also be found that, between the ages of 20—40, the ratio of the population in the Metropolis to its whole population exceeds that of the County of Hereford by 32 per cent.; and provided that the ratio of the married population and of births were the same in both districts, the still births and deaths in childbirth should also shew an excess of 32 per cent. on the whole population. For all exact inquiries into the sanitary condition of various districts, as well as for the purposes of Medical science, the proposed change is highly important. It is not enough for Medical Statistics to know that a certain number of deaths has taken place from any given disease, the ages at death must also be known, and it will then be seen at what periods of life particular diseases are most destructive. A clear exhibition of the facts under this aspect would point out the fluctuations and progress of disease, and afford means of applying effective remedial measures. These remarks apply with particular force to the prevalence of epidemics. A reference to the Mortality Bills of Glasgow will shew that within the last 10 years the mortality in mature life in one year has sometimes differed by 125 per cent. from that of another. The advantage of being able to point out the particular diseases producing this most remarkable distinction at given terms of life is evident. So also in England and Wales would the same kind of information be valuable; in fact, unless the ages at death be given, I can see no important use to be made of the simple registrations of the total deaths under a given disease.

There is another improvement coming within the scope of the Registration Act that would be of great advantage in determining the sanitary condition of various districts, and which would at the same time furnish an important element in the remedial Medical measures already alluded to. That is, to specify the particular employment, as well as the "cause of death;"—to Medical science the advantage of this



information is obvious. The age and cause of death viewed in connection with the peculiarity of employment would often lead to important results; and it may be easily shewn that no satisfactory conclusion can be arrived at, in inquiries into the state of the public health, unless the influence of employment be taken into consideration. I have found by an investigation, the results of which are now in the press with a view to publication, that the mortality of some trades at particular ages is from 30 to 40 per cent. above that of others, and it is therefore evident that if any particular town or locality had a preponderance of the unhealthy trades to the exclusion of the more healthy, such circumstance would account for an increased rate of mortality, independent of any peculiar local influence on the duration of life. The alterations suggested would, in this respect, be highly advantageous to the country in affording the means to determine the causes of the increased mortality of various districts, and lead to the removal of the particular conditions which render some trades so much more fatal to life than others.

There is but one other change of any importance which I shall venture to suggest, and that will complete the principal combinations which Schedule B., in the Registration Act, admits of. When the deaths are given for each month, or other division of time, during the year, not only the sex, as in all other cases, but also the age, employment or trade, and cause of death, should be specified for that period of time. This to some may seem of secondary value, but a reference to your own Reports will be a sufficient reply. If the gross number of deaths, in any particular period or season of the year, be given, as at present, in order to determine the influence of climate on the public health, that question is not half answered unless it be also known at what ages the destruction of life has taken place, and what diseases have been the more immediate cause of death.

It appears to me, that with less information than would be given by the improvements suggested, little practical advantage can result from the Registration Act. These improvements are also quite within the spirit, in fact, in the direct terms, of the Act. Place, date, sex, age, employment, and cause of death, are the six facts required, under Schedule B., to be registered of every death, and I have often regretted that the Country had not all the advantages which the Registration Act thus seems intended to convey, and which would be given by a proper exposition of those six facts.

Any minor combinations or arrangements, that might be of interest or public utility, it is unnecessary to allude to, deeming it of primary importance to have all the elementary facts, in the first place, abstracted, leaving to individual inquirers complicated combinations, when the means to satisfy more immediate and important questions are provided.

I do not think it necessary to say anything in respect of Schedules A. and C. The collateral arrangements which should follow the changes now suggested in Schedule B. will be easily affected.

From your letter it does not clearly appear whether I should suggest anything in reference to the enumeration of the population. In your own Reports, the necessity which exists to ascertain the population, at each time of life, in any district, before any useful results can be derived from the registration of deaths, has been clearly illustrated. I therefore think it not out of place to state that, among those giving attention to Vital Statistics, I have repeatedly heard it much complained of that the Report of the Census Commissioners, and your own Reports, should have been compiled with so little regard to each other. It appears to me that no two things should have been more intimately related in design and classification.

If, at this moment, it were required to determine the comparative value of life in any two counties in England, or any two towns in England, there exists no means of accomplishing it. For if the population of any particular place is obtained from the Report of the Census Commissioners,



the deaths, in your own Report, will be found for quite a different arrangement of districts, and *vice versa*. It would, therefore, be of great public value if means were adopted to remedy this evil, and to render the districts, in some way or other, *coterminous*, or at least to obtain the enumeration of the population, at each term of life, in your own districts, for the period of the last census, and to arrange for the same being done at the next census in 1851. The reasons that have been given for the necessity of distinguishing the age at death do equally apply to the enumeration of the population. If the gross population, without distinction of age, were therefore given for each of your districts, that would not answer the purposes contemplated.

The sanitary condition of various districts engages, at the present time, much of the public attention, and it is important that your Reports should afford the means of testing the opinions which many individual inquirers have so readily advanced on limited data and insufficient evidence.

I have the honour to be,

SIR,

Your most obedient Servant,

F. G. P. NEISON.

To THE REGISTRAR-GENERAL.

---

It will be found, on referring to the census of 1851, that the improvements suggested have been to a great extent carried out, and, with great judgment, the responsibility of so difficult and arduous an undertaking was entrusted to the Registrar-General and his two eminent and distinguished assistants, Dr. Farr and Mr. Horace Mann. The result of their labours is the most complete and valuable census ever known in this or any other country. It is, however, to be regretted that the occupations of the population with distinction of age for quinquennial periods has not been given in the published Reports for smaller communities than "Registration Counties." The population was so abstracted as to shew the occupations of males and females at quinquennial ages in each of the 624 districts of the country, and the sheets are preserved for future use and reference: the publication of the tables would have involved so large an amount of printing that it was not thought right to increase the bulk of the census' publications, which in their present compressed form, extend over four large closely printed folio volumes.

For the solution of many of the questions alluded to in the preceding letter, "Registration Counties" are too often so extensive, and contain a population of so diversified occupations, as to render the information as now given of but little value in its application to minor districts included within the major division. For example, the West Riding of Yorkshire, containing a population of 1,340,051, includes the important towns of Leeds, Sheffield, Bradford, Halifax, Huddersfield, and Wakefield, with populations varying from 172,270 in the former to 22,057 in the latter; and the East Riding of the same County, having a population of 254,352, includes the Borough of Hull and the City of York—the former with a population of 84,690, the latter with a population of 36,303—two places very dissimilar in the occupations of the inhabitants. In like manner, Lancashire, with a population of 2,067,301, includes Manchester and Salford with a population of 401,321



and Liverpool with a population of 375,955—the former containing 48,344 persons recorded as engaged in “cotton manufacture,” and the latter only 1048; so also will it be found that the number described as “seamen, pilots, and others connected with sea navigation,” is 17,898 in the latter, and no more than 163 in the former. It is hence obvious that the distinction of ages, as given for quinquennial terms of life in connection with the occupations of the people for the “Registration Counties,” cannot be available for such smaller districts as those just pointed out. This is very much to be lamented, for it is to the great commercial and manufacturing places that the uses above all others of such improvements in the enumeration of the population are particularly applicable and important. At the same time it may be remarked that, as in the census of 1841, the ages were not distinguished for the different occupations; and as the schedules of that enumeration were not re-abstracted by those entrusted with the recent census to admit a comparison of their results with those of 1851, the figures distinguishing the ages of those engaged in different occupations at the latter date will be of little use until the period of next census, when it is to be hoped that the Commissioners then to be appointed will, notwithstanding the additional expense and increased bulk of publication, be enabled to give the country the same kind of information now furnished in respect to “Registration Counties,” not only for the “Registration Districts,” but for the “Sub-Districts” also. The records preserved in connection with the census of 1851 are not, in their present unpublished condition, available to the public, and seeing the country has already incurred the expense of analysing the various Schedules, the additional cost of printing should not prevent the results from being placed at the disposal of every inquirer into questions which are so important to the national interest.

In regard to the suggestions made in the preceding letter on the subject of the registration of deaths, those familiar with the Reports of the Registrar-General will be aware that they are year after year being gradually carried out, and that the mortuary records of England and Wales are even at the present time by far the most complete, precise, and important in the world.

On the appearance of the Registrar's next Annual Report it will be found to distinguish for several districts of the country the ages at death, the immediate causes, and the occupations followed by the different persons. If such should be done for each District, and if possible for each sub-District also, for every year from the date of last census until the next in 1861, and the improvements in the census itself likewise persevered in, the country will then be put in possession of a body of information of the utmost value, more correct and definite views cannot fail to be disclosed on the nature and extent of the causes which affect the sanitary conditions of great masses of our population, the health and longevity of the people must be speedily improved, and consequently the prosperity, happiness, and moral elevation of all classes advanced and promoted.

---



## DURATION OF LIFE IN VARIOUS CLASSES.

---

THE data to which this part of the inquiry belongs have been derived from two sources. One portion—that relating to the Friendly Societies in England—has been obtained through the kindness of Mr. J. Tidd Pratt; and consists of the Quinquennial Returns for 1836–1840, made under the Friendly Societies Act, 10 Geo. IV. c. 56. § 34, as amended by 4 & 5 Wm. IV. c. 40. § 6. And an inspection of the form of schedule given under that Act will shew the nature and extent of the information which can be derived from this source.

It was considered that Returns from the Friendly Societies in Scotland would form a valuable contribution to Vital Statistics, and at the same time be interesting to compare with the results obtained from English Societies; especially as Mr. Ansell's valuable work had given rise to many curious conjectures on the comparative amount of Sickness in the two countries; the inquiry made by the Highland Society having exhibited a less degree of sickness among the Scotch Societies, than the results of Mr. Ansell's investigation shewed to be prevalent in Societies in England. Accordingly, in 1840, a number of blank schedules were sent to nearly every parish minister in Scotland, with a note requesting him to use his influence with the neighbouring Friendly Societies, to induce them to furnish the information required; but the attempt to procure data in this manner proved an almost complete failure. In 1843 another attempt was made, but on this occasion prizes were offered to those making the best and most complete returns; which had the desired effect of procuring a series of schedules filled up evidently with much care; and although very elaborate, the nicest attention seemed to be given to the minutest detail. These constitute the second source from which the data just referred to are derived.

On the various Schedules on which the elementary facts of the inquiry were written being procured from the different Societies, they were, in order to award the prizes, submitted to the individual scrutiny of Mr. Farr, of the Registrar-General's Office; Mr. Fletcher, Honorary Secretary to the Statistical Society; Dr. Guy, of King's College; and Mr. Phillips, of the Westminster Hospital.

Every Schedule to which the least suspicion attached, or on which any of the elementary facts were deficient, were immediately rejected, and nothing but the most satisfactory records were admitted as a portion of the general data.

As it is proposed to enter into a few points only of the inquiry, in this paper, a form of the Schedule is given, that an idea may be formed of the extent of the information obtained, as well as the combinations of which the varied character of the data is susceptible.



## DURATION OF LIFE

Society, Established in the Year \_\_\_\_\_ in the Town of \_\_\_\_\_ County of \_\_\_\_\_

| MEMBERS. |                      | Date of Birth. | Date of Admission into the Society. | Age at the time of Admission. | Date of becoming a Free Member. | The whole amount of time to which the Member has been entitled to Aliment, including Bed-lying, Walking-about, and every other description of Aliment: during the Years— |       |        |       |        |       |        |       | The part of that time which he has been entitled to Walking-about Pay only: during the Years— |       |        |       |        |       |        |       | DEATH.  |        |                     |                           |  | Date at which the Member ceased to belong to the Society: whether from arrears of Contributions, from Expulsion, or from any other cause except Death. | Number of Attacks of Illness. | Remarks. |
|----------|----------------------|----------------|-------------------------------------|-------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------|--------|-------|--------|-------|-----------------------------------------------------------------------------------------------|-------|--------|-------|--------|-------|--------|-------|---------|--------|---------------------|---------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------|
| Name.    | Occupation or Trade. |                |                                     |                               |                                 | 1831                                                                                                                                                                     |       | &c.    |       | &c.    |       | 1842   |       | 1831                                                                                          |       | &c.    |       | &c.    |       | 1842   |       | Date of | Age at | Disease or Cause of | Period sick before Death. |  |                                                                                                                                                        |                               |          |
|          |                      |                |                                     |                               |                                 | Weeks.                                                                                                                                                                   | Days. | Weeks. | Days. | Weeks. | Days. | Weeks. | Days. | Weeks.                                                                                        | Days. | Weeks. | Days. | Weeks. | Days. | Weeks. | Days. |         |        |                     |                           |  |                                                                                                                                                        |                               |          |
|          |                      |                |                                     |                               |                                 |                                                                                                                                                                          |       |        |       |        |       |        |       |                                                                                               |       |        |       |        |       |        |       |         |        |                     |                           |  |                                                                                                                                                        |                               |          |
|          |                      |                |                                     |                               |                                 |                                                                                                                                                                          |       |        |       |        |       |        |       |                                                                                               |       |        |       |        |       |        |       |         |        |                     |                           |  |                                                                                                                                                        |                               |          |

1. When any particular case of Sickness may have commenced in one year, and continued to the following year, care must be taken to ascribe the proper quantity of Sickness to each year.
2. Every Member's name, or initials, must be entered in the Schedule, whether he may have received aliment at any time or not.
3. In filling up the columns of Sickness, Sundays are meant to be included. If it should be more convenient to exclude them, please to state that you have done so.
4. If the Member's correct date of birth, and also his age at admission into the Society, be known, it will be entered as such; if not, his present age, his age at death or at expulsion, as the case may be, must be guessed at or approximated to by the person who fills up the Schedule, and also by any other person who may know the Member in question, and inserted in the column headed "Remarks." The age on the preceding birthday should be taken, if not otherwise expressed.
5. If it be the practice of the Society to distinguish between Bed-lying and Walking-about Pay, care must be taken to fill up the respective columns.
6. The column of Deaths, as well as the column of Members who have been expelled, or who have left the Society, must be filled up with much care.
7. Should it be inconvenient or impossible to furnish the information for any particular column, or columns, it is hoped that the remaining ones will be filled up with as much accuracy as possible.
8. If it should happen that the information given respecting any particular Member stands in need of any explanation, such is to be given in the column headed "Remarks."
9. If the columns for the whole period of twelve years cannot be filled up, please to fill up as many as possible.
10. It will also be important to have an Abstract of the Society's Income and Expenditure filled up in the annexed Form.
11. A copy of the Society's Printed Rules or Regulations will be useful; and if such cannot be forwarded, then a written abstract of the terms of Contribution from Members, and of the benefits or aliments afforded them; with any other information of a useful nature relating to the Society.
12. A copy of the return of Sickness and Mortality sent to the Barrister or Advocate appointed to certify the Rules of Friendly Societies, would be very desirable.
13. Insert, in the column headed "Remarks," how many times the Member may have been sick during the period referred to in the adjoining columns; for example, a Member may have experienced, in any one or more years, twenty weeks of sickness, which may have been all one attack of illness or it may represent three or four different attacks of illness; and the number of attacks is to be stated, which can always be done by referring to the Society's books, and seeing the number of applications he has made for sick allowance.
14. It is also to be kept in view, that when a Member's death is recorded, it should be stated in the columns headed "Disease or Cause of," for what period he was ill in the attack of sickness immediately preceding his death.

*Abstract of the Society's Income and Expenditure.*

| Date of balancing in the respective years. |      | Amount of Income during the preceding year, from |                                      | Amount of Expenditure during the preceding year, on account of |                             | Amount of Stock in hand at each period of balancing. |
|--------------------------------------------|------|--------------------------------------------------|--------------------------------------|----------------------------------------------------------------|-----------------------------|------------------------------------------------------|
|                                            |      | Contributions not including Arrears.             | Interest of Stock and other Sources. | Aliment in Sickness.                                           | Funeral and other expenses. |                                                      |
|                                            | 1831 |                                                  |                                      |                                                                |                             |                                                      |
|                                            | &c.  |                                                  |                                      |                                                                |                             |                                                      |
|                                            | &c.  |                                                  |                                      |                                                                |                             |                                                      |
|                                            | 1842 |                                                  |                                      |                                                                |                             |                                                      |

Number of Members in the Society on the \_\_\_\_\_ day of \_\_\_\_\_ 1831 \_\_\_\_\_  
 ... .. &c. \_\_\_\_\_  
 ... .. &c. \_\_\_\_\_  
 ... .. 1842 \_\_\_\_\_



The data were subsequently abstracted on sheets similar to the following, and the results of every Society were kept separate from those of every other. The results of every particular trade or employment were also kept distinct from those of every other occupation.

*Schedule on which the Original Facts were Abstracted.—Occupation.*

| No. | 10     |           |       |         | 11     |           |       |         | &c.    |           |       |         | &c.    |           |       |         | &c.    |           |       |         | &c.    |           |       |         | 99     |           |       |         | 100    |       |  |  | Remarks. |
|-----|--------|-----------|-------|---------|--------|-----------|-------|---------|--------|-----------|-------|---------|--------|-----------|-------|---------|--------|-----------|-------|---------|--------|-----------|-------|---------|--------|-----------|-------|---------|--------|-------|--|--|----------|
|     | Cases. | Sickness. |       | Deaths. | Cases. | Sickness. |       | Deaths. | Cases. | Sickness. |       | Deaths. | Cases. | Sickness. |       | Deaths. | Cases. | Sickness. |       | Deaths. | Cases. | Sickness. |       | Deaths. | Cases. | Sickness. |       | Deaths. |        |       |  |  |          |
|     |        | Weeks.    | Days. |         |        | Weeks.    | Days. |         |        | Weeks.    | Days. |         |        | Weeks.    | Days. |         |        | Weeks.    | Days. |         |        | Weeks.    | Days. |         |        | Weeks.    | Days. |         | Weeks. | Days. |  |  |          |
|     |        |           |       |         |        |           |       |         |        |           |       |         |        |           |       |         |        |           |       |         |        |           |       |         |        |           |       |         |        |       |  |  |          |

By this arrangement a means was afforded to measure the precise amount of Sickness and Mortality experienced by any particular Society, the ratio due to each year of life, and also how far its affairs were influenced by the particular trades and occupations of its Members.

All the Societies having been abstracted in this way, the results were afterwards combined in the following manner:—

The Societies belonging to the Rural Districts were placed in one group.

The Societies belonging to Town Districts were placed in another group.

And a third group was formed from those Societies established in the great Towns or Cities. A list of the places composing the respective groups of Rural Districts, Town Districts, and City Districts, is given in Appendix, Note II.

This plan was adopted in preference to a binary arrangement, in order to prevent a purely rural district from being mixed up with some of the smaller towns, and the great city districts with the larger towns.

The results of the first group, or Rural Districts, were then combined as follows. The totals of a given trade were placed on one of the Abstract Sheets; and the totals of the same trade in a second and a third Society, and so forth, were placed next in order on the same sheet, until all the Societies in the Rural Districts of the first county in alphabetical order were exhausted. The sums of those totals were then found, which shewed the amount of sickness and mortality among a certain number of persons at each age and of a given trade in that county. The same trade was carried through the rural districts of every other county in the same manner; and the totals for each county being added together, shewed the general result for that trade in the whole of the rural districts combined. The same trade was carried through the second group, or Town Districts, and also the third group, or City Districts, in precisely the same manner, so that an opportunity was thus afforded, of viewing the comparative degree of health, in the same occupation or employ-  
[ment,



## DURATION OF LIFE

TABLE E.

TRADES NOT CLASSIFIED.—RURAL DISTRICTS.—*Males.*

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 10   | 50           | 50          | ...          | ...         | ...       | 11·286       | 11·286      | 0·2257     | 10   |
| 11   | 91           | 1737        | ...          | 4           | 0·2302    | 72·572       | 1373·861    | 0·8485     | 11   |
| 12   | 163          |             | ...          |             |           | 180·572      |             |            | 12   |
| 13   | 254          |             | ...          |             |           | 255·858      |             |            | 13   |
| 14   | 423          |             | 1            |             |           | 402·144      |             |            | 14   |
| 15   | 806          |             | 3            |             |           | 462·715      |             |            | 15   |
| 16   | 1443         | 21408       | 10           | 159         | 0·7427    | 1036·572     | 17913·857   | 0·8367     | 16   |
| 17   | 2348         |             | 20           |             |           | 1870·572     |             |            | 17   |
| 18   | 3826         |             | 28           |             |           | 3046·143     |             |            | 18   |
| 19   | 5736         |             | 42           |             |           | 4921·428     |             |            | 19   |
| 20   | 8055         |             | 59           |             |           | 7039·142     |             |            | 20   |
| 21   | 10518        | 74586       | 75           | 550         | 0·7333    | 9135·856     | 62783·994   | 0·8417     | 21   |
| 22   | 13081        |             | 96           |             |           | 11065·856    |             |            | 22   |
| 23   | 15232        |             | 109          |             |           | 12714·856    |             |            | 23   |
| 24   | 17150        |             | 127          |             |           | 14151·713    |             |            | 24   |
| 25   | 18605        |             | 143          |             |           | 15715·713    |             |            | 25   |
| 26   | 19836        | 107009      | 153          | 760         | 0·7102    | 17252·713    | 95782·138   | 0·8950     | 26   |
| 27   | 20791        |             | 150          |             |           | 18295·427    |             |            | 27   |
| 28   | 21672        |             | 154          |             |           | 19914·856    |             |            | 28   |
| 29   | 22189        |             | 152          |             |           | 20343·428    |             |            | 29   |
| 30   | 22521        |             | 151          |             |           | 19975·714    |             |            | 30   |
| 31   | 22495        | 110107      | 154          | 785         | 0·7129    | 19281·857    | 93140·282   | 0·8459     | 31   |
| 32   | 22297        |             | 150          |             |           | 18901·000    |             |            | 32   |
| 33   | 21840        |             | 153          |             |           | 18020·142    |             |            | 33   |
| 34   | 21834        |             | 159          |             |           | 18192·856    |             |            | 34   |
| 35   | 21641        |             | 169          |             |           | 18744·427    |             |            | 35   |
| 36   | 21566        | 103887      | 163          | 801         | 0·7710    | 19461·570    | 101701·423  | 0·9789     | 36   |
| 37   | 21341        |             | 169          |             |           | 20218·570    |             |            | 37   |
| 38   | 21313        |             | 163          |             |           | 20797·999    |             |            | 38   |
| 39   | 20291        |             | 156          |             |           | 20663·999    |             |            | 39   |
| 40   | 19376        |             | 150          |             |           | 20559·285    |             |            | 40   |
| 41   | 18299        | 82763       | 150          | 692         | 0·8361    | 19893·570    | 97756·993   | 1·1811     | 41   |
| 42   | 17393        |             | 136          |             |           | 19747·141    |             |            | 42   |
| 43   | 16232        |             | 135          |             |           | 19453·570    |             |            | 43   |
| 44   | 15769        |             | 141          |             |           | 19322·570    |             |            | 44   |
| 45   | 15070        |             | 130          |             |           | 19340·142    |             |            | 45   |
| 46   | 14639        | 66447       | 132          | 686         | 1·0324    | 19275·428    | 90544·713   | 1·3626     | 46   |
| 47   | 14006        |             | 140          |             |           | 18744·143    |             |            | 47   |
| 48   | 13455        |             | 144          |             |           | 17796·571    |             |            | 48   |
| 49   | 12510        |             | 132          |             |           | 17345·857    |             |            | 49   |
| 50   | 11837        |             | 138          |             |           | 17382·714    |             |            | 50   |
| 51   | 10980        | 48361       | 133          | 702         | 1·4515    | 17718·857    | 93350·427   | 1·9302     | 51   |
| 52   | 10236        |             | 139          |             |           | 17994·428    |             |            | 52   |
| 53   | 9485         |             | 143          |             |           | 18670·714    |             |            | 53   |
| 54   | 9066         |             | 146          |             |           | 19254·857    |             |            | 54   |
| 55   | 8594         |             | 141          |             |           | 19711·571    |             |            | 55   |



TABLE E.—(continued.)

TRADES NOT CLASSIFIED.—RURAL DISTRICTS.—*Males.*

| Age.   | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|--------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|        | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|        |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 56     | 8151         | 36326       | 145          | 698         | 1.9215    | 20159.714    | 106070.284  | 2.9199     | 56   |
| 57     | 7768         |             | 142          |             |           | 20457.571    |             |            | 57   |
| 58     | 7382         |             | 141          |             |           | 21510.714    |             |            | 58   |
| 59     | 6789         |             | 139          |             |           | 21979.428    |             |            | 59   |
| 60     | 6236         |             | 131          |             |           | 21962.857    |             |            | 60   |
| 61     | 5692         |             | 122          |             |           | 21534.000    |             |            | 61   |
| 62     | 5121         | 23677       | 123          | 596         | 2.5172    | 21917.286    | 124379.429  | 5.2531     | 62   |
| 63     | 4613         |             | 121          |             |           | 23708.143    |             |            | 63   |
| 64     | 4286         |             | 116          |             |           | 27106.000    |             |            | 64   |
| 65     | 3965         |             | 114          |             |           | 30114.000    |             |            | 65   |
| 66     | 3694         |             | 117          |             |           | 33347.285    |             |            | 66   |
| 67     | 3453         |             | 130          |             |           | 35968.142    |             |            | 67   |
| 68     | 3188         | 15781       | 133          | 653         | 4.1378    | 36220.570    | 176695.852  | 11.1967    | 68   |
| 69     | 2870         |             | 132          |             |           | 35701.142    |             |            | 69   |
| 70     | 2576         |             | 141          |             |           | 35458.713    |             |            | 70   |
| 71     | 2248         |             | 138          |             |           | 34905.571    |             |            | 71   |
| 72     | 1931         |             | 116          |             |           | 33618.857    |             |            | 72   |
| 73     | 1666         |             | 104          |             |           | 32508.000    |             |            | 73   |
| 74     | 1472         | 8602        | 101          | 551         | 6.4054    | 30863.285    | 160791.141  | 18.6922    | 74   |
| 75     | 1285         |             | 92           |             |           | 28895.428    |             |            | 75   |
| 76     | 1130         |             | 85           |             |           | 26211.142    |             |            | 76   |
| 77     | 984          |             | 73           |             |           | 23605.142    |             |            | 77   |
| 78     | 855          |             | 66           |             |           | 20783.999    |             |            | 78   |
| 79     | 688          |             | 56           |             |           | 16875.856    |             |            | 79   |
| 80     | 546          | 4203        | 53           | 333         | 7.9229    | 13076.142    | 100552.281  | 23.9239    | 80   |
| 81     | 428          |             | 43           |             |           | 10298.856    |             |            | 81   |
| 82     | 339          |             | 42           |             |           | 8185.570     |             |            | 82   |
| 83     | 255          |             | 35           |             |           | 6316.428     |             |            | 83   |
| 84     | 208          |             | 31           |             |           | 5376.000     |             |            | 84   |
| 85     | 167          |             | 17           |             |           | 4748.857     |             |            | 85   |
| 86     | 139          | 1397        | 15           | 168         | 12.0257   | 4094.143     | 34925.711   | 25.0005    | 86   |
| 87     | 106          |             | 11           |             |           | 3155.715     |             |            | 87   |
| 88     | 84           |             | 8            |             |           | 2415.715     |             |            | 88   |
| 89     | 62           |             | 6            |             |           | 1733.858     |             |            | 89   |
| 90     | 44           |             | 5            |             |           | 1097.858     |             |            | 90   |
| 91     | 28           |             | 2            |             |           | 677.001      |             |            | 91   |
| 92     | 21           | 82          | ...          | 2           | 2.4390    | 483.001      | 1717.718    | 20.9477    | 92   |
| 93     | 14           |             | ...          |             |           | 274.715      |             |            | 93   |
| 94     | 11           |             | ...          |             |           | 170.572      |             |            | 94   |
| 95     | 8            |             | ...          |             |           | 112.429      |             |            | 95   |
| 96     | 6            |             | ...          |             |           | 52.286       |             |            | 96   |
| 97     | 5            |             | ...          |             |           | ...          |             |            | 97   |
| 98     | 5            | 25          | ...          | ...         | ...       | 52.286       | 2.0914      | 98         |      |
| 99     | 5            |             | ...          |             |           |              |             | ...        | 99   |
| 100    | 4            |             | ...          |             |           |              |             | ...        | 100  |
| 101    | 3            |             | ...          |             |           |              |             | ...        | 101  |
| 706886 |              |             | 8185         |             | 1.1579    | 1372040.965  |             | 1.9410     |      |



TABLE E.—(continued.)

TRADES NOT CLASSIFIED.—TOWN DISTRICTS.—*Males.*

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 10   | 15           | 15          | ...          | ...         | ...       | 19·000       | 19·000      | 1·2666     | 10   |
| 11   | 48           | 1454        | ...          | 4           | 0·2751    | 29·857       | 1036·712    | 0·7130     | 11   |
| 12   | 109          |             | ...          |             |           | 61·571       |             |            | 12   |
| 13   | 206          |             | 1            |             |           | 160·571      |             |            | 13   |
| 14   | 403          |             | 1            |             |           | 270·428      |             |            | 14   |
| 15   | 688          |             | 2            |             |           | 514·285      |             |            | 15   |
| 16   | 1017         | 9315        | 7            | 50          | 0·5367    | 727·285      | 7765·284    | 0·8336     | 16   |
| 17   | 1390         |             | 8            |             |           | 1070·571     |             |            | 17   |
| 18   | 1826         |             | 8            |             |           | 1465·571     |             |            | 18   |
| 19   | 2278         |             | 13           |             |           | 2041·714     |             |            | 19   |
| 20   | 2804         |             | 14           |             |           | 2460·143     |             |            | 20   |
| 21   | 3460         | 25473       | 13           | 136         | 0·5338    | 3099·429     | 22731·143   | 0·8907     | 21   |
| 22   | 4224         |             | 19           |             |           | 3837·000     |             |            | 22   |
| 23   | 5076         |             | 29           |             |           | 4598·286     |             |            | 23   |
| 24   | 5958         |             | 33           |             |           | 5290·000     |             |            | 24   |
| 25   | 6755         |             | 42           |             |           | 5906·428     |             |            | 25   |
| 26   | 7442         | 41592       | 49           | 286         | 0·6876    | 6300·713     | 34582·425   | 0·8314     | 26   |
| 27   | 8004         |             | 53           |             |           | 6524·428     |             |            | 27   |
| 28   | 8422         |             | 55           |             |           | 6788·428     |             |            | 28   |
| 29   | 8720         |             | 62           |             |           | 7237·428     |             |            | 29   |
| 30   | 9004         |             | 67           |             |           | 7731·428     |             |            | 30   |
| 31   | 9205         | 46837       | 73           | 383         | 0·8177    | 8066·000     | 44573·284   | 0·9516     | 31   |
| 32   | 9318         |             | 75           |             |           | 8458·857     |             |            | 32   |
| 33   | 9381         |             | 79           |             |           | 9080·428     |             |            | 33   |
| 34   | 9506         |             | 80           |             |           | 9288·571     |             |            | 34   |
| 35   | 9427         |             | 76           |             |           | 9679·428     |             |            | 35   |
| 36   | 9269         | 43221       | 71           | 385         | 0·8907    | 9938·571     | 47601·997   | 1·1013     | 36   |
| 37   | 9072         |             | 81           |             |           | 10061·714    |             |            | 37   |
| 38   | 8815         |             | 77           |             |           | 9653·571     |             |            | 38   |
| 39   | 8255         |             | 78           |             |           | 9144·142     |             |            | 39   |
| 40   | 7810         |             | 78           |             |           | 8803·999     |             |            | 40   |
| 41   | 7411         | 34220       | 77           | 364         | 1·0637    | 8981·284     | 51863·133   | 1·5155     | 41   |
| 42   | 7055         |             | 66           |             |           | 9543·426     |             |            | 42   |
| 43   | 6710         |             | 73           |             |           | 10186·426    |             |            | 43   |
| 44   | 6588         |             | 74           |             |           | 11242·141    |             |            | 44   |
| 45   | 6456         |             | 74           |             |           | 11909·856    |             |            | 45   |
| 46   | 6279         | 28781       | 81           | 415         | 1·4419    | 12552·428    | 66420·570   | 2·3077     | 46   |
| 47   | 6058         |             | 89           |             |           | 13032·857    |             |            | 47   |
| 48   | 5840         |             | 83           |             |           | 13391·857    |             |            | 48   |
| 49   | 5504         |             | 79           |             |           | 13637·714    |             |            | 49   |
| 50   | 5100         |             | 83           |             |           | 13805·714    |             |            | 50   |



TABLE E.—(continued.)

TRADES NOT CLASSIFIED.—TOWN DISTRICTS.—*Males.*

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 51   | 4704         | 20318       | 78           | 387         | 1·9047    | 13249·571    | 59499·141   | 2·9283     | 51   |
| 52   | 4341         |             | 74           |             |           | 12215·285    |             |            | 52   |
| 53   | 3998         |             | 75           |             |           | 11786·857    |             |            | 53   |
| 54   | 3748         |             | 80           |             |           | 11240·000    |             |            | 54   |
| 55   | 3527         |             | 80           |             |           | 11007·428    |             |            | 55   |
| 56   | 3286         | 13341       | 88           | 392         | 2·9383    | 11096·428    | 51563·851   | 3·8650     | 56   |
| 57   | 3025         |             | 85           |             |           | 11361·285    |             |            | 57   |
| 58   | 2717         |             | 82           |             |           | 10744·856    |             |            | 58   |
| 59   | 2335         |             | 73           |             |           | 9769·141     |             |            | 59   |
| 60   | 1978         |             | 64           |             |           | 8592·141     |             |            | 60   |
| 61   | 1699         | 6673        | 53           | 252         | 3·7764    | 7815·570     | 43278·569   | 6·4856     | 61   |
| 62   | 1462         |             | 56           |             |           | 7772·428     |             |            | 62   |
| 63   | 1268         |             | 51           |             |           | 8158·428     |             |            | 63   |
| 64   | 1163         |             | 46           |             |           | 9176·143     |             |            | 64   |
| 65   | 1081         |             | 46           |             |           | 10356·000    |             |            | 65   |
| 66   | 978          | 3847        | 45           | 207         | 5·3808    | 10969·571    | 50466·567   | 13·1184    | 66   |
| 67   | 867          |             | 35           |             |           | 10864·285    |             |            | 67   |
| 68   | 782          |             | 38           |             |           | 10746·142    |             |            | 68   |
| 69   | 665          |             | 43           |             |           | 9632·427     |             |            | 69   |
| 70   | 555          |             | 46           |             |           | 8254·142     |             |            | 70   |
| 71   | 470          | 1830        | 41           | 183         | 10·0000   | 7573·285     | 34900·569   | 19·0713    | 71   |
| 72   | 410          |             | 42           |             |           | 7070·142     |             |            | 72   |
| 73   | 354          |             | 39           |             |           | 6629·714     |             |            | 73   |
| 74   | 315          |             | 33           |             |           | 6746·000     |             |            | 74   |
| 75   | 281          |             | 28           |             |           | 6881·428     |             |            | 75   |
| 76   | 247          | 898         | 26           | 89          | 9·9109    | 6716·571     | 28221·140   | 31·4266    | 76   |
| 77   | 207          |             | 22           |             |           | 6218·428     |             |            | 77   |
| 78   | 170          |             | 17           |             |           | 5596·142     |             |            | 78   |
| 79   | 146          |             | 14           |             |           | 5088·142     |             |            | 79   |
| 80   | 128          |             | 10           |             |           | 4601·857     |             |            | 80   |
| 81   | 112          | 439         | 11           | 55          | 12·5284   | 3899·714     | 15505·715   | 35·3205    | 81   |
| 82   | 101          |             | 12           |             |           | 3487·000     |             |            | 82   |
| 83   | 89           |             | 11           |             |           | 3107·000     |             |            | 83   |
| 84   | 76           |             | 10           |             |           | 2720·572     |             |            | 84   |
| 85   | 61           |             | 11           |             |           | 2291·429     |             |            | 85   |
| 86   | 48           | 140         | 9            | 29          | 20·7142   | 2010·572     | 6033·575    | 43·0969    | 86   |
| 87   | 36           |             | 6            |             |           | 1610·715     |             |            | 87   |
| 88   | 27           |             | 6            |             |           | 1189·001     |             |            | 88   |
| 89   | 18           |             | 5            |             |           | 754·715      |             |            | 89   |
| 90   | 11           |             | 3            |             |           | 468·572      |             |            | 90   |
| 91   | 6            | 8           | 2            | 3           | 37·5000   | 256·429      | 349·715     | 43·7143    | 91   |
| 92   | 2            |             | 1            |             |           | 93·286       |             |            | 92   |
|      | 278402       |             | 3620         |             | 1·3003    | 566412·390   |             | 2·0309     |      |



TABLE E.—(continued.)

TRADES NOT CLASSIFIED.—CITY DISTRICTS.—*Males.*

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |    |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|----|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |    |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |    |
| 10   | ...          | ...         | ...          | ...         | ...       | ...          | ...         | ...        | 10   |    |
| 11   | ...          | 10          | ...          | ...         | ...       | ...          | ...         | ...        | 11   |    |
| 12   | ...          |             | ...          | ...         | ...       | ...          |             |            | ...  | 12 |
| 13   | ...          |             | ...          | ...         | ...       | ...          |             |            | ...  | 13 |
| 14   | 3            |             | ...          | ...         | ...       | ...          |             |            | ...  | 14 |
| 15   | 7            | 443         | ...          | ...         | ...       | ...          | 153·000     | 0·3453     | 15   |    |
| 16   | 12           |             | ...          | ...         | ...       | ...          |             |            | ...  | 16 |
| 17   | 23           |             | ...          | ...         | ...       | ...          |             |            | ...  | 17 |
| 18   | 56           |             | ...          | ...         | ...       | 10·000       |             |            | ...  | 18 |
| 19   | 113          | 6684        | ...          | ...         | ...       | 36·143       | 5904·709    | 0·8968     | 19   |    |
| 20   | 239          |             | ...          | ...         | ...       | 106·857      |             |            | ...  | 20 |
| 21   | 450          |             | 1            | ...         | ...       | 344·571      |             |            | ...  | 21 |
| 22   | 798          |             | 5            | ...         | ...       | 615·999      |             |            | ...  | 22 |
| 23   | 1236         | 21640       | 7            | 44          | 0·6682    | 975·285      | 23100·565   | 1·0674     | 23   |    |
| 24   | 1798         |             | 14           | ...         | ...       | 1720·570     |             |            | ...  | 24 |
| 25   | 2402         |             | 17           | ...         | ...       | 2248·284     |             |            | ...  | 25 |
| 26   | 3047         |             | 22           | ...         | ...       | 2901·427     |             |            | ...  | 26 |
| 27   | 3717         | 30333       | 29           | ...         | ...       | 3720·713     | 40876·285   | 1·3475     | 27   |    |
| 28   | 4395         |             | 40           | 196         | 0·9057    | 4670·141     |             |            | ...  | 28 |
| 29   | 4972         |             | 47           | ...         | ...       | 5390·713     |             |            | ...  | 29 |
| 30   | 5509         |             | 58           | ...         | ...       | 6417·571     |             |            | ...  | 30 |
| 31   | 5903         | 31086       | 62           | ...         | ...       | 6851·428     | 36180·285   | 1·1638     | 31   |    |
| 32   | 6130         |             | 57           | ...         | ...       | 7087·000     |             |            | ...  | 32 |
| 33   | 6248         |             | 64           | 330         | 1·0615    | 7218·000     |             |            | ...  | 33 |
| 34   | 6380         |             | 69           | ...         | ...       | 7381·286     |             |            | ...  | 34 |
| 35   | 6425         | 30333       | 78           | ...         | ...       | 7642·571     | 40876·285   | 1·3475     | 35   |    |
| 36   | 6381         |             | 80           | ...         | ...       | 8072·857     |             |            | ...  | 36 |
| 37   | 6271         |             | 81           | ...         | ...       | 8102·571     |             |            | ...  | 37 |
| 38   | 6146         |             | 78           | 383         | 1·2626    | 8208·714     |             |            | ...  | 38 |
| 39   | 5878         | 25428       | 74           | ...         | ...       | 8262·714     | 41823·427   | 1·6447     | 39   |    |
| 40   | 5657         |             | 70           | ...         | ...       | 8229·429     |             |            | ...  | 40 |
| 41   | 5478         |             | 76           | ...         | ...       | 8144·857     |             |            | ...  | 41 |
| 42   | 5329         |             | 84           | ...         | ...       | 8645·428     |             |            | ...  | 42 |
| 43   | 5097         | 18857       | 84           | 409         | 1·6084    | 8654·857     | 38926·425   | 2·0642     | 43   |    |
| 44   | 4907         |             | 85           | ...         | ...       | 8366·857     |             |            | ...  | 44 |
| 45   | 4617         |             | 80           | ...         | ...       | 8011·428     |             |            | ...  | 45 |
| 46   | 4419         |             | 79           | ...         | ...       | 7991·428     |             |            | ...  | 46 |
| 47   | 4006         | 18857       | 74           | ...         | ...       | 7752·428     | 38926·425   | 2·0642     | 47   |    |
| 48   | 3758         |             | 66           | 332         | 1·7606    | 7696·285     |             |            | ...  | 48 |
| 49   | 3475         |             | 59           | ...         | ...       | 7779·142     |             |            | ...  | 49 |
| 50   | 3199         |             | 54           | ...         | ...       | 7707·142     |             |            | ...  | 50 |



TABLE E.—(continued.)

TRADES NOT CLASSIFIED.—CITY DISTRICTS.—Males.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 51   | 2966         | 12452       | 53           | 275         | 2.2084    | 7567.428     | 35632.710   | 2.8616     | 51   |
| 52   | 2722         |             | 54           |             |           | 7303.285     |             |            | 52   |
| 53   | 2460         |             | 57           |             |           | 7047.999     |             |            | 53   |
| 54   | 2247         |             | 58           |             |           | 6968.999     |             |            | 54   |
| 55   | 2057         |             | 53           |             |           | 6774.999     |             |            | 55   |
| 56   | 1847         | 7459        | 43           | 181         | 2.4266    | 6308.571     | 29588.140   | 3.9667     | 56   |
| 57   | 1663         |             | 39           |             |           | 6149.571     |             |            | 57   |
| 58   | 1494         |             | 32           |             |           | 6051.428     |             |            | 58   |
| 59   | 1312         |             | 30           |             |           | 5772.285     |             |            | 59   |
| 60   | 1143         |             | 37           |             |           | 5306.285     |             |            | 60   |
| 61   | 1004         | 3823        | 37           | 152         | 3.9759    | 5017.570     | 20236.565   | 5.2933     | 61   |
| 62   | 869          |             | 34           |             |           | 4477.570     |             |            | 62   |
| 63   | 743          |             | 31           |             |           | 3938.713     |             |            | 63   |
| 64   | 644          |             | 29           |             |           | 3471.856     |             |            | 64   |
| 65   | 563          |             | 21           |             |           | 3330.856     |             |            | 65   |
| 66   | 490          | 2027        | 19           | 112         | 5.5254    | 3042.142     | 13813.710   | 6.8148     | 66   |
| 67   | 447          |             | 23           |             |           | 2789.142     |             |            | 67   |
| 68   | 410          |             | 26           |             |           | 2736.142     |             |            | 68   |
| 69   | 364          |             | 33           |             |           | 2645.142     |             |            | 69   |
| 70   | 316          |             | 21           |             |           | 2601.142     |             |            | 70   |
| 71   | 278          | 988         | 22           | 76          | 7.6923    | 2716.428     | 14504.286   | 14.6804    | 71   |
| 72   | 230          |             | 17           |             |           | 2890.143     |             |            | 72   |
| 73   | 183          |             | 13           |             |           | 2821.286     |             |            | 73   |
| 74   | 157          |             | 12           |             |           | 2885.429     |             |            | 74   |
| 75   | 140          |             | 12           |             |           | 3191.000     |             |            | 75   |
| 76   | 123          | 525         | 10           | 57          | 10.8571   | 3461.857     | 17821.427   | 33.9455    | 76   |
| 77   | 116          |             | 10           |             |           | 3823.428     |             |            | 77   |
| 78   | 111          |             | 12           |             |           | 3913.714     |             |            | 78   |
| 79   | 97           |             | 13           |             |           | 3660.428     |             |            | 79   |
| 80   | 78           |             | 12           |             |           | 2962.000     |             |            | 80   |
| 81   | 59           | 166         | 10           | 29          | 17.4698   | 2225.000     | 6158.286    | 37.0981    | 81   |
| 82   | 40           |             | 8            |             |           | 1466.286     |             |            | 82   |
| 83   | 28           |             | 5            |             |           | 1037.000     |             |            | 83   |
| 84   | 21           |             | 3            |             |           | 742.000      |             |            | 84   |
| 85   | 18           |             | 3            |             |           | 688.000      |             |            | 85   |
| 86   | 14           | 34          | 3            | 9           | 26.4705   | 550.000      | 1258.000    | 37.0000    | 86   |
| 87   | 10           |             | 2            |             |           | 372.000      |             |            | 87   |
| 88   | 6            |             | 2            |             |           | 216.000      |             |            | 88   |
| 89   | 3            |             | 1            |             |           | 112.000      |             |            | 89   |
| 90   | 1            |             | 1            |             |           | 8.000        |             |            | 90   |
|      | 161955       |             | 2585         |             | 1.5971    | 325977.820   |             | 2.0140     |      |



## DURATION OF LIFE

TABLE E.—(continued.)

TRADES NOT CLASSIFIED.—RURAL, TOWN, AND CITY DISTRICTS.—Males.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 10   | 65           | 65          | ...          | ...         | ...       | 30·286       | 30·286      | 0·4659     | 10   |
| 11   | 139          | 3201        | ...          | 8           | 0·2499    | 102·429      | 2410·573    | 0·7530     | 11   |
| 12   | 272          |             | ...          |             |           | 242·143      |             |            | 12   |
| 13   | 460          |             | 1            |             |           | 416·429      |             |            | 13   |
| 14   | 829          |             | 2            |             |           | 672·572      |             |            | 14   |
| 15   | 1501         |             | 5            |             |           | 977·000      |             |            | 15   |
| 16   | 2472         | 31166       | 17           | 209         | 0·6706    | 1763·857     | 25832·141   | 0·8288     | 16   |
| 17   | 3761         |             | 28           |             |           | 2941·143     |             |            | 17   |
| 18   | 5708         |             | 36           |             |           | 4521·714     |             |            | 18   |
| 19   | 8127         |             | 55           |             |           | 6999·285     |             |            | 19   |
| 20   | 11098        |             | 73           |             |           | 9606·142     |             |            | 20   |
| 21   | 14428        | 106743      | 89           | 730         | 0·6838    | 12579·856    | 91419·850   | 0·8564     | 21   |
| 22   | 18103        |             | 120          |             |           | 15518·856    |             |            | 22   |
| 23   | 21544        |             | 145          |             |           | 18288·427    |             |            | 23   |
| 24   | 24906        |             | 174          |             |           | 21162·284    |             |            | 24   |
| 25   | 27762        |             | 202          |             |           | 23870·427    |             |            | 25   |
| 26   | 30325        | 170241      | 224          | 1242        | 0·7295    | 26454·856    | 153465·139  | 0·9014     | 26   |
| 27   | 32512        |             | 232          |             |           | 28540·570    |             |            | 27   |
| 28   | 34489        |             | 249          |             |           | 31373·428    |             |            | 28   |
| 29   | 35881        |             | 261          |             |           | 32971·571    |             |            | 29   |
| 30   | 37034        |             | 276          |             |           | 34124·714    |             |            | 30   |
| 31   | 37603        | 188030      | 289          | 1498        | 0·7966    | 34199·285    | 173893·855  | 0·9248     | 31   |
| 32   | 37745        |             | 282          |             |           | 34446·857    |             |            | 32   |
| 33   | 37469        |             | 296          |             |           | 34318·571    |             |            | 33   |
| 34   | 37720        |             | 308          |             |           | 34862·714    |             |            | 34   |
| 35   | 37493        |             | 323          |             |           | 36066·428    |             |            | 35   |
| 36   | 37216        | 177441      | 314          | 1569        | 0·8786    | 37473·000    | 190179·711  | 1·0718     | 36   |
| 37   | 36684        |             | 331          |             |           | 38382·857    |             |            | 37   |
| 38   | 36274        |             | 318          |             |           | 38660·285    |             |            | 38   |
| 39   | 34424        |             | 308          |             |           | 38070·856    |             |            | 39   |
| 40   | 32843        |             | 298          |             |           | 37592·713    |             |            | 40   |
| 41   | 31188        | 142411      | 303          | 1465        | 1·0287    | 37019·713    | 191443·567  | 1·3443     | 41   |
| 42   | 29777        |             | 286          |             |           | 37935·998    |             |            | 42   |
| 43   | 28039        |             | 292          |             |           | 38294·856    |             |            | 43   |
| 44   | 27264        |             | 300          |             |           | 38931·571    |             |            | 44   |
| 45   | 26143        |             | 284          |             |           | 39261·429    |             |            | 45   |
| 46   | 25337        | 114085      | 292          | 1433        | 1·2571    | 39819·286    | 195891·714  | 1·7185     | 46   |
| 47   | 24070        |             | 303          |             |           | 39529·429    |             |            | 47   |
| 48   | 23053        |             | 293          |             |           | 38884·714    |             |            | 48   |
| 49   | 21489        |             | 270          |             |           | 38762·714    |             |            | 49   |
| 50   | 20136        |             | 275          |             |           | 38895·571    |             |            | 50   |
| 51   | 18650        | 81131       | 264          | 1364        | 1·6812    | 38535·856    | 188482·281  | 2·3231     | 51   |
| 52   | 17299        |             | 267          |             |           | 37512·999    |             |            | 52   |
| 53   | 15943        |             | 275          |             |           | 37505·571    |             |            | 53   |
| 54   | 15061        |             | 284          |             |           | 37463·856    |             |            | 54   |
| 55   | 14178        |             | 274          |             |           | 37463·999    |             |            | 55   |



TABLE E.—(continued.)

TRADES NOT CLASSIFIED.—RURAL, TOWN, AND CITY DISTRICTS.—Males.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 56   | 13284        | 57126       | 276          | 1271        | 2.2249    | 37564.714    | 187222.283  | 3.2773     | 56   |
| 57   | 12456        |             | 266          |             |           | 37968.428    |             |            | 57   |
| 58   | 11593        |             | 255          |             |           | 38306.999    |             |            | 58   |
| 59   | 10436        |             | 242          |             |           | 37520.857    |             |            | 59   |
| 60   | 9357         |             | 232          |             |           | 35861.285    |             |            | 60   |
| 61   | 8395         | 34173       | 212          | 1000        | 2.9262    | 34367.142    | 187894.567  | 5.4983     | 61   |
| 62   | 7452         |             | 213          |             |           | 34167.285    |             |            | 62   |
| 63   | 6624         |             | 203          |             |           | 35805.285    |             |            | 63   |
| 64   | 6093         |             | 191          |             |           | 39753.999    |             |            | 64   |
| 65   | 5609         |             | 181          |             |           | 43800.856    |             |            | 65   |
| 66   | 5162         | 21655       | 181          | 972         | 4.4885    | 47358.999    | 240976.141  | 11.1279    | 66   |
| 67   | 4767         |             | 188          |             |           | 49621.571    |             |            | 67   |
| 68   | 4380         |             | 197          |             |           | 49702.857    |             |            | 68   |
| 69   | 3899         |             | 198          |             |           | 47978.714    |             |            | 69   |
| 70   | 3447         |             | 208          |             |           | 46314.000    |             |            | 70   |
| 71   | 2996         | 11420       | 201          | 810         | 7.0928    | 45195.285    | 210195.995  | 18.4059    | 71   |
| 72   | 2571         |             | 175          |             |           | 43579.142    |             |            | 72   |
| 73   | 2203         |             | 156          |             |           | 41958.999    |             |            | 73   |
| 74   | 1944         |             | 146          |             |           | 40494.713    |             |            | 74   |
| 75   | 1706         |             | 132          |             |           | 38967.856    |             |            | 75   |
| 76   | 1500         | 5626        | 121          | 479         | 8.5140    | 36389.571    | 146594.853  | 26.0566    | 76   |
| 77   | 1307         |             | 105          |             |           | 33646.999    |             |            | 77   |
| 78   | 1136         |             | 95           |             |           | 30293.856    |             |            | 78   |
| 79   | 931          |             | 83           |             |           | 25624.428    |             |            | 79   |
| 80   | 752          |             | 75           |             |           | 20639.999    |             |            | 80   |
| 81   | 599          | 2002        | 64           | 252         | 12.5874   | 16423.570    | 56589.711   | 28.2665    | 81   |
| 82   | 480          |             | 62           |             |           | 13138.856    |             |            | 82   |
| 83   | 372          |             | 51           |             |           | 10460.428    |             |            | 83   |
| 84   | 305          |             | 44           |             |           | 8838.571     |             |            | 84   |
| 85   | 246          |             | 31           |             |           | 7728.286     |             |            | 85   |
| 86   | 201          | 609         | 27           | 83          | 13.6289   | 6654.715     | 19788.857   | 32.4940    | 86   |
| 87   | 152          |             | 19           |             |           | 5138.429     |             |            | 87   |
| 88   | 117          |             | 16           |             |           | 3820.714     |             |            | 88   |
| 89   | 83           |             | 12           |             |           | 2600.571     |             |            | 89   |
| 90   | 56           |             | 9            |             |           | 1574.428     |             |            | 90   |
| 91   | 34           | 90          | 4            | 5           | 5.5555    | 933.428      | 2067.430    | 22.9714    | 91   |
| 92   | 23           |             | 1            |             |           | 576.286      |             |            | 92   |
| 93   | 14           |             | ...          |             |           | 274.715      |             |            | 93   |
| 94   | 11           |             | ...          |             |           | 170.572      |             |            | 94   |
| 95   | 8            |             | ...          |             |           | 112.429      |             |            | 95   |
| 96   | 6            | 25          | ...          | ...         | ...       | 52.286       | 52.286      | 2.0914     | 96   |
| 97   | 5            |             | ...          |             |           | ...          |             |            | 97   |
| 98   | 5            |             | ...          |             |           | ...          |             |            | 98   |
| 99   | 5            |             | ...          |             |           | ...          |             |            | 99   |
| 100  | 4            |             | ...          |             |           | ...          |             |            | 100  |
| 101  | 3            | 3           | ...          | ...         | ...       | ...          | ...         | ...        | 101  |
|      | 1147243      |             | 14390        |             | 1.2544    | 2264431.240  |             | 1.9740     |      |



ment, in the three districts referred to. Those three districts were next combined, to give the general results for that trade without regard to locality. A second trade was taken up in the like manner, and carried through precisely the same steps, and so also were other trades until all were exhausted. The totals of the various trades in the Rural Districts were then combined, giving the general results for that district without regard to occupation, and so on with each of the other districts; and the combination of these last three gave of course the general results, without regard to either trade or locality.

All the possible combinations of those elements of the data being thus made, the next step was to exhibit the results in a convenient form, from which to make useful deductions. Tables were therefore formed, shewing the total number of persons, at every year of life over which the observations extend—the number of deaths among them yearly—and the amount of sickness yearly, expressed in weeks and decimals of a week. In the same Tables are also given the same facts for quinquennial periods of life, also the rate of mortality per cent., and the average amount of sickness per annum to each person.

As these observations extend over upwards of 400 different trades or occupations, the examination of each under the varied combinations described, would involve the consideration of so immense a number of Tables, as would evidently perplex the present inquiry. Such only will therefore be brought forward as seem to bear distinctly on the more immediate question, What is the influence of Locality on Health and on the Duration of Life?

TABLE E, one of the class just referred to, will be useful in pointing out the distinction in the rates of Mortality in quinquennial periods of life, between the Male Population in the Rural, Town and City Districts, and for minute purposes of detail will no doubt afford many interesting illustrations; but on the present occasion a more extended and general view of the results is necessary, and an inspection of Table F will therefore be of more importance. This Table is formed from Table E, in precisely the same manner that Table C was formed from Table B. On inspection of the results under the head “Rural Districts,” it will be seen that the highest Specific Intensity is attained at the youngest ages in the Table, and that it decreases up to Age 20, from which Age up to 31 it increases, and then decreases gradually till near the extreme of life. A comparison of the Specific Intensity as given in this Table, with the general result for the Male Population in England and Wales as set forth in Table C, will shew a higher intensity of life through the whole range of the Table, maintaining at the same time a very remarkable parallelism.

It will be seen that the Specific Intensity

At Age 20 in Table C is as high as at Age 39 in Table F (Rural Districts)

|     |    |     |     |    |     |
|-----|----|-----|-----|----|-----|
| ... | 30 | ... | ... | 47 | ... |
| ... | 40 | ... | ... | 50 | ... |
| ... | 50 | ... | ... | 55 | ... |
| ... | 60 | ... | ... | 63 | ... |
| ... | 70 | ... | ... | 71 | ... |

[An approximating



TABLE F.

TRADES NOT CLASSIFIED.—RURAL DISTRICTS.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 230    | .230                   | 434.783                | 56   | 69171   | 1199   | 1.734                  | 57.676                 |
| 11   | 99770   | 229    | .230                   | 434.783                | 57   | 67972   | 1246   | 1.833                  | 54.555                 |
| 12   | 99541   | 249    | .250                   | 400.000                | 58   | 66726   | 1293   | 1.937                  | 51.626                 |
| 13   | 99292   | 289    | .291                   | 343.643                | 59   | 65433   | 1339   | 2.046                  | 48.876                 |
| 14   | 99003   | 349    | .353                   | 283.286                | 60   | 64094   | 1384   | 2.160                  | 46.296                 |
| 15   | 98654   | 429    | .435                   | 229.885                | 61   | 62710   | 1429   | 2.279                  | 43.879                 |
| 16   | 98225   | 527    | .537                   | 186.212                | 62   | 61281   | 1495   | 2.439                  | 41.004                 |
| 17   | 97698   | 605    | .619                   | 161.551                | 63   | 59786   | 1578   | 2.640                  | 37.879                 |
| 18   | 97093   | 660    | .680                   | 147.059                | 64   | 58208   | 1678   | 2.882                  | 34.698                 |
| 19   | 96433   | 694    | .720                   | 138.890                | 65   | 56530   | 1789   | 3.165                  | 31.596                 |
| 20   | 95739   | 708    | .739                   | 135.318                | 66   | 54741   | 1910   | 3.489                  | 28.661                 |
| 21   | 95031   | 700    | .737                   | 135.685                | 67   | 52831   | 2028   | 3.839                  | 26.048                 |
| 22   | 94331   | 692    | .734                   | 136.240                | 68   | 50803   | 2141   | 4.215                  | 23.725                 |
| 23   | 93639   | 685    | .731                   | 136.799                | 69   | 48662   | 2246   | 4.616                  | 21.664                 |
| 24   | 92954   | 676    | .727                   | 137.552                | 70   | 46416   | 2341   | 5.044                  | 19.825                 |
| 25   | 92278   | 667    | .723                   | 138.313                | 71   | 44075   | 2423   | 5.498                  | 18.188                 |
| 26   | 91611   | 659    | .719                   | 139.082                | 72   | 41652   | 2466   | 5.921                  | 16.889                 |
| 27   | 90952   | 650    | .715                   | 139.860                | 73   | 39186   | 2474   | 6.314                  | 15.838                 |
| 28   | 90302   | 643    | .712                   | 140.449                | 74   | 36712   | 2452   | 6.678                  | 14.974                 |
| 29   | 89659   | 637    | .711                   | 140.647                | 75   | 34260   | 2402   | 7.012                  | 14.261                 |
| 30   | 89022   | 633    | .711                   | 140.647                | 76   | 31858   | 2330   | 7.315                  | 13.670                 |
| 31   | 88389   | 628    | .711                   | 140.647                | 77   | 29528   | 2283   | 7.730                  | 12.936                 |
| 32   | 87761   | 627    | .714                   | 140.056                | 78   | 27245   | 2250   | 8.257                  | 12.111                 |
| 33   | 87134   | 626    | .719                   | 139.082                | 79   | 24995   | 2223   | 8.894                  | 11.243                 |
| 34   | 86508   | 628    | .726                   | 137.741                | 80   | 22772   | 2196   | 9.644                  | 10.369                 |
| 35   | 85880   | 632    | .736                   | 135.870                | 81   | 20576   | 2153   | 10.464                 | 9.560                  |
| 36   | 85248   | 637    | .747                   | 133.869                | 82   | 18423   | 2035   | 11.045                 | 9.057                  |
| 37   | 84611   | 642    | .759                   | 131.752                | 83   | 16388   | 1866   | 11.387                 | 8.779                  |
| 38   | 83969   | 648    | .772                   | 129.534                | 84   | 14522   | 1669   | 11.490                 | 8.703                  |
| 39   | 83321   | 653    | .784                   | 127.551                | 85   | 12853   | 1459   | 11.353                 | 8.810                  |
| 40   | 82668   | 659    | .797                   | 125.470                | 86   | 11394   | 1255   | 11.017                 | 9.074                  |
| 41   | 82009   | 664    | .810                   | 123.457                | 87   | 10139   | 1127   | 11.115                 | 9.001                  |
| 42   | 81345   | 674    | .828                   | 120.773                | 88   | 9012    | 1064   | 11.809                 | 8.467                  |
| 43   | 80671   | 687    | .852                   | 117.371                | 89   | 7948    | 1041   | 13.100                 | 7.633                  |
| 44   | 79984   | 704    | .880                   | 113.636                | 90   | 6907    | 1023   | 14.809                 | 6.752                  |
| 45   | 79280   | 725    | .914                   | 109.409                | 91   | 5884    | 1018   | 17.314                 | 5.777                  |
| 46   | 78555   | 749    | .953                   | 104.931                | 92   | 4866    | 982    | 20.173                 | 4.958                  |
| 47   | 77806   | 779    | 1.001                  | 99.900                 | 93   | 3884    | 912    | 23.476                 | 4.261                  |
| 48   | 77027   | 816    | 1.059                  | 94.429                 | 94   | 2972    | 821    | 27.625                 | 3.621                  |
| 49   | 76211   | 857    | 1.125                  | 88.889                 | 95   | 2151    | 706    | 32.826                 | 3.046                  |
| 50   | 75354   | 904    | 1.200                  | 83.333                 | 96   | 1445    | 565    | 39.132                 | 2.555                  |
| 51   | 74450   | 956    | 1.284                  | 77.882                 | 97   | 880     | 386    | 47.046                 | 2.125                  |
| 52   | 73494   | 1007   | 1.370                  | 72.993                 | 98   | 494     | 285    | 57.777                 | 1.731                  |
| 53   | 72487   | 1057   | 1.458                  | 68.587                 | 99   | 209     | 138    | 66.037                 | 1.514                  |
| 54   | 71430   | 1106   | 1.548                  | 64.599                 | 100  | 71      | 71     | 85.000                 | 1.176                  |
| 55   | 70324   | 1153   | 1.640                  | 60.976                 |      |         |        |                        |                        |



## DURATION OF LIFE

TABLE F.—(continued.)

TRADES NOT CLASSIFIED.—TOWNS.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 275    | ·275                   | 363·636                | 56   | 65638   | 1657   | 2·524                  | 39·620                 |
| 11   | 99725   | 274    | ·275                   | 363·636                | 57   | 63981   | 1742   | 2·723                  | 36·724                 |
| 12   | 99451   | 283    | ·285                   | 350·877                | 58   | 62239   | 1815   | 2·916                  | 34·294                 |
| 13   | 99168   | 303    | ·306                   | 326·797                | 59   | 60424   | 1871   | 3·097                  | 32·289                 |
| 14   | 98865   | 333    | ·337                   | 296·736                | 60   | 58553   | 1916   | 3·273                  | 30·553                 |
| 15   | 98532   | 373    | ·379                   | 263·852                | 61   | 56637   | 1948   | 3·440                  | 29·036                 |
| 16   | 98159   | 424    | ·432                   | 231·481                | 62   | 54689   | 1990   | 3·639                  | 27·480                 |
| 17   | 97735   | 462    | ·473                   | 211·416                | 63   | 52699   | 2039   | 3·868                  | 25·853                 |
| 18   | 97273   | 491    | ·505                   | 198·020                | 64   | 50660   | 2091   | 4·128                  | 24·225                 |
| 19   | 96782   | 508    | ·525                   | 190·476                | 65   | 48569   | 2146   | 4·418                  | 22·635                 |
| 20   | 96274   | 515    | ·535                   | 186·916                | 66   | 46423   | 2130   | 4·739                  | 21·101                 |
| 21   | 95759   | 512    | ·535                   | 186·916                | 67   | 44293   | 2294   | 5·180                  | 19·305                 |
| 22   | 95247   | 516    | ·540                   | 185·185                | 68   | 41999   | 2412   | 5·742                  | 17·415                 |
| 23   | 94731   | 523    | ·552                   | 181·159                | 69   | 39587   | 2544   | 6·425                  | 15·564                 |
| 24   | 94208   | 538    | ·571                   | 175·131                | 70   | 37043   | 2678   | 7·228                  | 13·835                 |
| 25   | 93670   | 557    | ·595                   | 168·067                | 71   | 34365   | 2801   | 8·152                  | 12·267                 |
| 26   | 93113   | 583    | ·626                   | 159·744                | 72   | 31564   | 2805   | 8·888                  | 11·251                 |
| 27   | 92530   | 607    | ·656                   | 152·439                | 73   | 28759   | 2713   | 9·435                  | 10·599                 |
| 28   | 91923   | 630    | ·685                   | 145·985                | 74   | 26046   | 2551   | 9·794                  | 10·210                 |
| 29   | 91293   | 651    | ·713                   | 140·252                | 75   | 23495   | 2341   | 9·964                  | 10·036                 |
| 30   | 90642   | 671    | ·740                   | 135·135                | 76   | 21154   | 2104   | 9·946                  | 10·054                 |
| 31   | 89971   | 689    | ·766                   | 130·548                | 77   | 19050   | 1912   | 10·037                 | 9·960                  |
| 32   | 89282   | 705    | ·790                   | 126·582                | 78   | 17138   | 1754   | 10·235                 | 9·775                  |
| 33   | 88577   | 718    | ·811                   | 123·305                | 79   | 15384   | 1622   | 10·542                 | 9·488                  |
| 34   | 87859   | 729    | ·830                   | 120·482                | 80   | 13762   | 1508   | 10·957                 | 9·124                  |
| 35   | 87130   | 738    | ·847                   | 118·064                | 81   | 12254   | 1407   | 11·481                 | 8·711                  |
| 36   | 86392   | 744    | ·861                   | 116·144                | 82   | 10847   | 1326   | 12·227                 | 8·176                  |
| 37   | 85648   | 754    | ·880                   | 113·636                | 83   | 9521    | 1256   | 13·196                 | 7·581                  |
| 38   | 84894   | 766    | ·902                   | 110·865                | 84   | 8265    | 1189   | 14·388                 | 6·949                  |
| 39   | 84128   | 782    | ·929                   | 107·643                | 85   | 7076    | 1118   | 15·802                 | 6·329                  |
| 40   | 83346   | 800    | ·960                   | 104·167                | 86   | 5958    | 1036   | 17·439                 | 5·734                  |
| 41   | 82546   | 821    | ·994                   | 100·603                | 87   | 4922    | 956    | 19·420                 | 5·149                  |
| 42   | 81725   | 847    | 1·037                  | 96·432                 | 88   | 3966    | 864    | 21·746                 | 4·598                  |
| 43   | 80878   | 880    | 1·088                  | 91·912                 | 89   | 3102    | 757    | 24·415                 | 4·097                  |
| 44   | 79998   | 918    | 1·147                  | 87·184                 | 90   | 2345    | 643    | 27·428                 | 3·646                  |
| 45   | 79080   | 959    | 1·213                  | 82·440                 | 91   | 1702    | 524    | 30·785                 | 3·249                  |
| 46   | 78121   | 1008   | 1·290                  | 77·519                 | 92   | 1178    | 396    | 33·584                 | 2·978                  |
| 47   | 77113   | 1056   | 1·369                  | 73·046                 | 93   | 782     | 280    | 35·829                 | 2·791                  |
| 48   | 76057   | 1104   | 1·452                  | 68·871                 | 94   | 502     | 188    | 37·518                 | 2·665                  |
| 49   | 74953   | 1152   | 1·537                  | 65·062                 | 95   | 314     | 123    | 39·287                 | 2·545                  |
| 50   | 73801   | 1201   | 1·627                  | 61·463                 | 96   | 191     | 78     | 40·995                 | 2·439                  |
| 51   | 72600   | 1248   | 1·719                  | 58·174                 | 97   | 113     | 49     | 43·643                 | 2·292                  |
| 52   | 71352   | 1309   | 1·835                  | 54·496                 | 98   | 64      | 33     | 50·913                 | 1·964                  |
| 53   | 70043   | 1382   | 1·973                  | 50·684                 | 99   | 31      | 16     | 51·307                 | 1·948                  |
| 54   | 68661   | 1465   | 2·134                  | 46·860                 | 100  | 15      | 15     | 75·000                 | 1·333                  |
| 55   | 67196   | 1558   | 2·318                  | 43·141                 |      |         |        |                        |                        |



TABLE F.—(continued.)

TRADES NOT CLASSIFIED.—CITIES.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 396    | ·3961                  | 252·525                | 56   | 58620   | 1371   | 2·3393                 | 42·753                 |
| 11   | 99604   | 395    | ·3961                  | 252·525                | 57   | 57249   | 1395   | 2·4361                 | 41·051                 |
| 12   | 99209   | 401    | ·4038                  | 247·525                | 58   | 55854   | 1445   | 2·5863                 | 38·669                 |
| 13   | 98808   | 414    | ·4193                  | 238·664                | 59   | 54409   | 1518   | 2·7896                 | 35·842                 |
| 14   | 98394   | 435    | ·4426                  | 225·734                | 60   | 52891   | 1611   | 3·0463                 | 32·830                 |
| 15   | 97959   | 464    | ·4736                  | 210·971                | 61   | 51280   | 1721   | 3·3561                 | 29·797                 |
| 16   | 97495   | 499    | ·5123                  | 195·313                | 62   | 49559   | 1817   | 3·6660                 | 27·278                 |
| 17   | 96996   | 545    | ·5511                  | 181·488                | 63   | 47742   | 1898   | 3·9759                 | 25·151                 |
| 18   | 96451   | 569    | ·5900                  | 169·492                | 64   | 45844   | 1965   | 4·2858                 | 23·332                 |
| 19   | 95882   | 596    | ·6212                  | 161·031                | 65   | 43879   | 2017   | 4·5957                 | 21·758                 |
| 20   | 95286   | 614    | ·6446                  | 155·039                | 66   | 41862   | 2054   | 4·9056                 | 20·383                 |
| 21   | 94672   | 627    | ·6603                  | 151·512                | 67   | 39808   | 2086   | 5·2402                 | 19·084                 |
| 22   | 94045   | 637    | ·6777                  | 147·493                | 68   | 37722   | 2112   | 5·5995                 | 17·860                 |
| 23   | 93408   | 651    | ·6967                  | 143·472                | 69   | 35610   | 2131   | 5·9832                 | 16·714                 |
| 24   | 92757   | 673    | ·7252                  | 137·931                | 70   | 33479   | 2140   | 6·3921                 | 15·644                 |
| 25   | 92084   | 703    | ·7632                  | 131·062                | 71   | 31339   | 2139   | 6·8255                 | 14·652                 |
| 26   | 91181   | 739    | ·8107                  | 123·305                | 72   | 29200   | 2131   | 7·2988                 | 13·701                 |
| 27   | 90442   | 770    | ·8509                  | 117·509                | 73   | 27069   | 2115   | 7·8120                 | 12·801                 |
| 28   | 89672   | 793    | ·8839                  | 113·122                | 74   | 24954   | 2087   | 8·3651                 | 11·954                 |
| 29   | 88879   | 808    | ·9095                  | 110·011                | 75   | 22867   | 2049   | 8·9582                 | 11·163                 |
| 30   | 88071   | 817    | ·9280                  | 107·759                | 76   | 20818   | 1997   | 9·5911                 | 10·426                 |
| 31   | 87254   | 837    | ·9591                  | 104·275                | 77   | 18821   | 1950   | 10·3620                | 9·652                  |
| 32   | 86417   | 861    | ·9961                  | 100·402                | 78   | 16871   | 1902   | 11·2708                | 8·873                  |
| 33   | 85556   | 889    | 1·0389                 | 96·246                 | 79   | 14969   | 1844   | 12·3175                | 8·117                  |
| 34   | 84667   | 921    | 1·0875                 | 91·996                 | 80   | 13125   | 1772   | 13·5021                | 7·407                  |
| 35   | 83746   | 956    | 1·1419                 | 87·564                 | 81   | 11353   | 1675   | 14·8247                | 6·748                  |
| 36   | 82790   | 979    | 1·1821                 | 84·602                 | 82   | 9678    | 1572   | 16·2427                | 6·158                  |
| 37   | 81811   | 1005   | 1·2281                 | 81·433                 | 83   | 8106    | 1439   | 17·7563                | 5·631                  |
| 38   | 80806   | 1035   | 1·2799                 | 78·125                 | 84   | 6667    | 1291   | 19·3654                | 5·165                  |
| 39   | 79771   | 1067   | 1·3375                 | 74·794                 | 85   | 5376    | 1133   | 21·0700                | 4·746                  |
| 40   | 78704   | 1103   | 1·4009                 | 71·377                 | 86   | 4243    | 970    | 22·8702                | 4·373                  |
| 41   | 77601   | 1141   | 1·4700                 | 68·027                 | 87   | 3273    | 812    | 24·7975                | 4·032                  |
| 42   | 76460   | 1171   | 1·5314                 | 65·360                 | 88   | 2461    | 661    | 26·8519                | 3·724                  |
| 43   | 75289   | 1193   | 1·5851                 | 63·092                 | 89   | 1800    | 523    | 29·0335                | 3·445                  |
| 44   | 74096   | 1209   | 1·6310                 | 61·312                 | 90   | 1277    | 400    | 31·3423                | 3·191                  |
| 45   | 72887   | 1217   | 1·6692                 | 59·916                 | 91   | 877     | 296    | 33·7782                | 2·960                  |
| 46   | 71670   | 1218   | 1·6997                 | 58·823                 | 92   | 581     | 208    | 35·8437                | 2·790                  |
| 47   | 70452   | 1227   | 1·7419                 | 57·405                 | 93   | 373     | 140    | 37·5389                | 2·664                  |
| 48   | 69225   | 1243   | 1·7960                 | 55·679                 | 94   | 233     | 91     | 38·8636                | 2·573                  |
| 49   | 67982   | 1266   | 1·8619                 | 53·706                 | 95   | 142     | 57     | 39·8180                | 2·511                  |
| 50   | 66716   | 1294   | 1·9397                 | 51·546                 | 96   | 85      | 34     | 40·4020                | 2·475                  |
| 51   | 65422   | 1328   | 2·0292                 | 49·285                 | 97   | 51      | 22     | 44·1099                | 2·267                  |
| 52   | 64094   | 1352   | 2·1096                 | 47·393                 | 98   | 29      | 15     | 51·1463                | 1·955                  |
| 53   | 62742   | 1368   | 2·1808                 | 45·851                 | 99   | 14      | 8      | 51·3067                | 1·949                  |
| 54   | 61374   | 1377   | 2·2428                 | 44·583                 | 100  | 6       | 6      | 75·0000                | 1·333                  |
| 55   | 59997   | 1377   | 2·2956                 | 43·554                 |      |         |        |                        |                        |



TABLE F.—(continued.)

TRADES NOT CLASSIFIED.—RURAL, TOWN, AND CITY DISTRICTS.—Males.

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 250    | ·2499                  | 400·000                | 56   | 66509   | 1335   | 2·0074                 | 49·825                 |
| 11   | 99750   | 249    | ·2499                  | 400·000                | 57   | 65174   | 1383   | 2·1224                 | 47·125                 |
| 12   | 99501   | 265    | ·2667                  | 374·532                | 58   | 63791   | 1431   | 2·2437                 | 44·563                 |
| 13   | 99236   | 298    | ·3004                  | 333·333                | 59   | 62360   | 1479   | 2·3714                 | 42·176                 |
| 14   | 98938   | 347    | ·3508                  | 284·900                | 60   | 60881   | 1525   | 2·5054                 | 39·920                 |
| 15   | 98591   | 412    | ·4181                  | 239·234                | 61   | 59356   | 1570   | 2·6456                 | 37·793                 |
| 16   | 98179   | 493    | ·5022                  | 199·203                | 62   | 57786   | 1630   | 2·8203                 | 35·461                 |
| 17   | 97686   | 557    | ·5701                  | 175·439                | 63   | 56156   | 1701   | 3·0295                 | 33·014                 |
| 18   | 97129   | 604    | ·6216                  | 160·771                | 64   | 54455   | 1782   | 3·2730                 | 30·553                 |
| 19   | 96525   | 634    | ·6568                  | 152·207                | 65   | 52673   | 1871   | 3·5511                 | 28·161                 |
| 20   | 95891   | 648    | ·6758                  | 147·929                | 66   | 50802   | 1963   | 3·8635                 | 25·887                 |
| 21   | 95243   | 646    | ·6785                  | 147·493                | 67   | 48839   | 2060   | 4·2177                 | 23·708                 |
| 22   | 94597   | 646    | ·6824                  | 146·628                | 68   | 46779   | 2158   | 4·6135                 | 21·673                 |
| 23   | 93951   | 646    | ·6876                  | 145·349                | 69   | 44621   | 2254   | 5·0509                 | 19·798                 |
| 24   | 93305   | 648    | ·6942                  | 144·092                | 70   | 42367   | 2343   | 5·5301                 | 18·083                 |
| 25   | 92657   | 650    | ·7020                  | 142·450                | 71   | 40024   | 2422   | 6·0510                 | 16·526                 |
| 26   | 92007   | 654    | ·7112                  | 140·647                | 72   | 37602   | 2453   | 6·5246                 | 15·326                 |
| 27   | 91353   | 659    | ·7212                  | 138·696                | 73   | 35149   | 2443   | 6·9508                 | 14·386                 |
| 28   | 90694   | 664    | ·7320                  | 136·612                | 74   | 32706   | 2397   | 7·3296                 | 13·643                 |
| 29   | 90030   | 670    | ·7437                  | 134·409                | 75   | 30309   | 2322   | 7·6612                 | 13·053                 |
| 30   | 89360   | 676    | ·7563                  | 132·275                | 76   | 27987   | 2224   | 7·9455                 | 12·586                 |
| 31   | 88684   | 683    | ·7697                  | 129·870                | 77   | 25763   | 2148   | 8·3358                 | 11·996                 |
| 32   | 88001   | 690    | ·7837                  | 127·551                | 78   | 23615   | 2086   | 8·8322                 | 11·322                 |
| 33   | 87311   | 697    | ·7983                  | 125·313                | 79   | 21529   | 2031   | 9·4347                 | 10·598                 |
| 34   | 86614   | 705    | ·8136                  | 122·850                | 80   | 19498   | 1982   | 10·1433                | 9·862                  |
| 35   | 85909   | 713    | ·8294                  | 120·627                | 81   | 17516   | 1919   | 10·9580                | 9·124                  |
| 36   | 85196   | 721    | ·8458                  | 118·203                | 82   | 15597   | 1817   | 11·6514                | 8·584                  |
| 37   | 84475   | 731    | ·8649                  | 115·607                | 83   | 13780   | 1684   | 12·2236                | 8·183                  |
| 38   | 83744   | 743    | ·8868                  | 112·740                | 84   | 12096   | 1533   | 12·6744                | 7·893                  |
| 39   | 83001   | 756    | ·9113                  | 109·769                | 85   | 10563   | 1374   | 13·0040                | 7·692                  |
| 40   | 82245   | 772    | ·9386                  | 106·496                | 86   | 9189    | 1214   | 13·2123                | 7·570                  |
| 41   | 81473   | 789    | ·9686                  | 103·199                | 87   | 7975    | 1118   | 14·0171                | 7·138                  |
| 42   | 80684   | 808    | 1·0018                 | 99·001                 | 88   | 6857    | 1057   | 15·4183                | 6·485                  |
| 43   | 79876   | 829    | 1·0380                 | 96·339                 | 89   | 5800    | 1010   | 17·4160                | 5·740                  |
| 44   | 79047   | 852    | 1·0775                 | 92·850                 | 90   | 4790    | 958    | 20·0102                | 4·997                  |
| 45   | 78195   | 876    | 1·1200                 | 89·286                 | 91   | 3832    | 889    | 23·2008                | 4·310                  |
| 46   | 77319   | 901    | 1·1657                 | 85·763                 | 92   | 2943    | 783    | 26·5925                | 3·761                  |
| 47   | 76418   | 932    | 1·2192                 | 81·967                 | 93   | 2160    | 644    | 29·8333                | 3·352                  |
| 48   | 75486   | 967    | 1·2806                 | 78·064                 | 94   | 1516    | 501    | 33·0399                | 3·289                  |
| 49   | 74519   | 1006   | 1·3497                 | 74·074                 | 95   | 1015    | 369    | 36·3588                | 2·750                  |
| 50   | 73513   | 1049   | 1·4267                 | 70·077                 | 96   | 646     | 256    | 39·6498                | 2·522                  |
| 51   | 72464   | 1095   | 1·5115                 | 66·137                 | 97   | 390     | 176    | 45·1555                | 2·215                  |
| 52   | 71369   | 1143   | 1·6011                 | 62·461                 | 98   | 214     | 113    | 52·9127                | 1·890                  |
| 53   | 70226   | 1191   | 1·6955                 | 58·997                 | 99   | 101     | 62     | 61·3067                | 1·631                  |
| 54   | 69035   | 1239   | 1·7947                 | 55·710                 | 100  | 39      | 39     | 75·0000                | 1·333                  |
| 55   | 67796   | 1287   | 1·8986                 | 52·659                 |      |         |        |                        |                        |



An approximating value taking place up to about this period, after which they again diverge to near the extreme of life.

The population existing at Age 10 in Table C is halved between ages 62-3; while in Table F (Rural Districts) the same result is not determined till ages 68-9;—shewing under this aspect a superior vitality of six years.

If the results in Table F for the Town Districts be now inspected, it will be seen that the Specific Intensity decreases in a regular series, from the beginning to the extreme of the Table. It will also appear that the Specific Intensity is higher than Male Life in Table C up to Age 52, and from that to age 76 it is less. From the latter age to the extreme of life, they cross each other. The following are the ages at which the corresponding Specific Intensities in Both Tables are nearly equal.

Age 20 in C corresponds with Age 31 in F (Town Districts)

|        |     |     |    |     |
|--------|-----|-----|----|-----|
| ... 30 | ... | ... | 41 | ... |
| ... 40 | ... | ... | 45 | ... |
| ... 50 | ... | ... | 50 | ... |
| ... 60 | ... | ... | 58 | ... |
| ... 70 | ... | ... | 68 | ... |
| ... 80 | ... | ... | 82 | ... |

In Table F (Town Districts) it will be seen that half the population disappears between ages 64-5, and it has been shewn that in Table C the same result takes place at ages 62-3.

Turning next to the results for the City Districts in Table F, it will be seen that the Specific Intensity decreases from the earliest age to the other extreme of the Table, in a uniform series. In this Table it will also appear, that from the age of 10 to 33 there is a higher Specific Intensity than in Table C; and from 33 to the extreme of life, the Specific Intensity in the City Districts of Table F is less than in the Male Life of Table C, which represents the general results for England and Wales. The following will shew the ages corresponding to equal specific intensities in both Tables:—

Age 20 in C corresponds nearly with age 25 in F (City Districts)

|        |     |     |    |     |
|--------|-----|-----|----|-----|
| ... 30 | ... | ... | 33 | ... |
| ... 40 | ... | ... | 37 | ... |
| ... 50 | ... | ... | 46 | ... |
| ... 60 | ... | ... | 59 | ... |
| ... 70 | ... | ... | 69 | ... |
| ... 80 | ... | ... | 79 | ... |

Half of the population, it will be seen in Table F (City Districts), has died off between the



ages of 61 and 62, while among Males in England and Wales that happened at ages 62 and 63; being in this instance one year in favour of the Table for the General Results of the Country.

Taking a view of the three Districts respectively, as given in Table F, in conjunction with Table C, it will be seen that there is

A higher Specific Intensity in the Rural Districts up to the extreme of Life, than in Table C,

|     |     |                                    |     |     |     |     |
|-----|-----|------------------------------------|-----|-----|-----|-----|
| ... | ... | Town Districts up to the Age of 52 |     |     |     | ... |
| ... | ... | City                               | ... | ... | ... | 33  |

From this it would appear, that the lower the age of equal Specific Intensity, the worse the class of lives to which it refers. Another comparison of these three classes of results with Table C will shew the following series of Differences for the corresponding ages of equal Specific Intensity:—

| Age.                              | Rural Districts. | Town Districts. | City Districts. |
|-----------------------------------|------------------|-----------------|-----------------|
| 20                                | 19               | 11              | 5               |
| 30                                | 17               | 11              | 3               |
| 40                                | 10               | 5               | 3               |
| 50                                | 5                | 0               | — 4             |
| 60                                | 3                | — 2             | — 1             |
| 70                                | 1                | — 2             | — 1             |
|                                   | —                | —               | —               |
| Sums of the series of differences | 55               | 23              | 5               |

This arrangement of the differences of corresponding periods of equal Specific Intensity also points out a gradual approximation to lower numbers, moving from the Rural towards the City Districts. And a third illustration of the same fact will be found in comparing the periods at which the equation of life is determined for age 10. It is in—

| Table C.     | F—Rural Districts. | F—Town Districts. | F—City Districts. |
|--------------|--------------------|-------------------|-------------------|
| At Ages 62—3 | 68—9               | 64—5              | 61—2              |
| difference   | 6 years.           | 2 years.          | — 1 year.         |

As before stated, the illustrations drawn from the Specific Intensity must be understood to have reference to the identical periods only of life at which the comparisons are made, and not to the absolute value of life in any of the classes. It will, however, at all times, be found important to keep in view the specific intensity of such Tables, as it affords the readiest means to discover those periods at which any peculiar change or difference in the condition of life is taking place. Various diseases have a maximum or minimum effect in destroying life at certain periods; and if a change to a higher specific intensity were found to take place at any given period, the diseases peculiar to that period should be falling from their maximum towards the minimum.



In the three Districts now under consideration, it appears that in all except one, the Specific Intensity uniformly decreased from the beginning to the end of the Table; but in the Rural Districts the Specific Intensity was found to increase from ages 20–31. Some change, either in the Rural Districts, or uniformly in the two others, must therefore have taken place in the causes affecting the duration of life at that period; and if the nature of this paper led to an examination of the diseases generally prevalent at the same period, the probability is that Consumption and Diseases of the Chest would be found less malignant at that term of life, in relation to the preceding and subsequent periods of life, in the Rural than in either the Town or City Districts.

The next arrangement of the data to which reference will be made, is the “After-lifetime,” or Expectation of Life. This mode of expressing the Duration of Life is certainly that which is of the most interest to society; for it points out the average number of years which one member of the community with another participates in the pleasures and cares of life. The Expectation of Life is often confounded with the chance of living an equivalent number of years; but the distinction will be subsequently explained.

In Table G will be found the Expectation of Life for each of the three districts, and also the General Results for those three combined. A comparison of the expectation under the head “Rural Districts,” with the expectation for Males in England and Wales, as given in Table D, will shew a much higher value of life in the Rural Districts throughout the whole range of the Table. At age 10 the difference is 5·5 years in favour of the Rural Districts, at 30 it is 4·3 years, and at 60 the difference is 2·1 years. The following arrangement of the results of the two tables, at decennial periods, will convey a general idea of their relative values of life:—

| Age. | EXPECTATION.     |                    | Difference in favour of the Rural Districts. |           |
|------|------------------|--------------------|----------------------------------------------|-----------|
|      | Rural Districts. | England and Wales. | In Years.                                    | Per Cent. |
| 20   | 45·3550          | 40·6910            | 4·6640                                       | 11·462    |
| 30   | 38·4073          | 34·0990            | 4·3083                                       | 11·191    |
| 40   | 30·9724          | 27·4760            | 3·4964                                       | 12·725    |
| 50   | 23·4700          | 20·8463            | 2·6237                                       | 12·585    |
| 60   | 16·6524          | 14·5854            | 2·0670                                       | 14·171    |
| 70   | 10·9124          | 9·2176             | 1·6948                                       | 18·386    |

A comparison of the results for the Town Districts, will shew a superior expectation up to Age 35, after which period the expectation is in favour of Male Life, in the General Table for England and Wales. The following Abstract shews the results for decennial periods.

[The Expectation



TABLE G.

EXPECTATION.—TRADES NOT CLASSIFIED.—*Males.*

| Age. | Rural Districts. | Town Districts. | City Districts. | Rural, Town, and City Districts. | Age. | Rural Districts. | Town Districts. | City Districts. | Rural, Town, and City Districts. |
|------|------------------|-----------------|-----------------|----------------------------------|------|------------------|-----------------|-----------------|----------------------------------|
| 10   | 53.2581          | 50.5373         | 47.9129         | 51.8097                          | 56   | 19.2867          | 16.0651         | 16.2599         | 18.2005                          |
| 11   | 52.3797          | 49.6753         | 47.1014         | 50.9383                          | 57   | 18.6181          | 15.4682         | 15.6373         | 17.5630                          |
| 12   | 51.4638          | 48.8108         | 46.2870         | 50.0646                          | 58   | 17.9163          | 14.8871         | 15.0154         | 16.9330                          |
| 13   | 50.6269          | 47.9486         | 45.4728         | 49.1969                          | 59   | 17.3014          | 14.3193         | 14.4009         | 16.3101                          |
| 14   | 49.7733          | 47.0941         | 44.6620         | 48.3436                          | 60   | 16.6524          | 13.7608         | 13.7685         | 15.6942                          |
| 15   | 48.9480          | 46.2515         | 43.8482         | 47.5120                          | 61   | 16.0089          | 13.2095         | 13.2177         | 15.0845                          |
| 16   | 48.1593          | 45.4254         | 43.0645         | 46.7093                          | 62   | 15.3705          | 12.6622         | 12.6593         | 14.4808                          |
| 17   | 47.4163          | 44.6203         | 42.2834         | 45.9425                          | 63   | 14.7424          | 12.1215         | 12.1221         | 13.8866                          |
| 18   | 46.7086          | 43.8298         | 41.5195         | 45.2031                          | 64   | 14.1284          | 11.5892         | 11.6033         | 13.3047                          |
| 19   | 46.0249          | 43.0496         | 40.7630         | 44.4828                          | 65   | 13.5330          | 11.0666         | 11.1005         | 12.7379                          |
| 20   | 45.3550          | 42.2742         | 40.0148         | 43.7736                          | 66   | 12.9589          | 10.5551         | 10.6113         | 12.1886                          |
| 21   | 44.6890          | 41.4988         | 39.2711         | 43.0680                          | 67   | 12.4093          | 10.0386         | 10.1330         | 11.6585                          |
| 22   | 44.0170          | 40.7192         | 38.5295         | 42.3587                          | 68   | 11.8847          | 9.5596          | 9.6657          | 11.1498                          |
| 23   | 43.3385          | 39.9383         | 37.7889         | 41.6465                          | 69   | 11.3856          | 9.1116          | 9.2093          | 10.6649                          |
| 24   | 42.6543          | 39.1572         | 37.0506         | 40.9314                          | 70   | 10.9124          | 8.7030          | 8.7636          | 10.2057                          |
| 25   | 41.9631          | 38.5540         | 36.3177         | 40.2141                          | 71   | 10.4654          | 8.3423          | 8.3279          | 9.7739                           |
| 26   | 41.2649          | 37.6059         | 35.6725         | 39.4947                          | 72   | 10.0451          | 8.0382          | 7.9013          | 9.3712                           |
| 27   | 40.5603          | 36.8396         | 34.9598         | 38.7739                          | 73   | 9.6458           | 7.7735          | 7.4840          | 8.9903                           |
| 28   | 39.8486          | 36.0796         | 34.2557         | 38.0520                          | 74   | 9.2622           | 7.5311          | 7.0759          | 8.6245                           |
| 29   | 39.1308          | 35.3251         | 33.5569         | 37.3289                          | 75   | 8.8893           | 7.2944          | 6.6761          | 8.2670                           |
| 30   | 38.4073          | 34.5753         | 32.8603         | 36.6051                          | 76   | 8.5218           | 7.0463          | 6.2840          | 7.9114                           |
| 31   | 37.6787          | 33.8294         | 32.1632         | 35.8803                          | 77   | 8.1548           | 6.7694          | 5.8977          | 7.5512                           |
| 32   | 36.9448          | 33.0866         | 31.4698         | 35.1549                          | 78   | 7.7962           | 6.4688          | 5.5216          | 7.1926                           |
| 33   | 36.3078          | 32.3460         | 30.7815         | 34.4288                          | 79   | 7.4530           | 6.1493          | 5.1596          | 6.8411                           |
| 34   | 35.4654          | 31.6062         | 30.0995         | 33.7018                          | 80   | 7.1317           | 5.8152          | 4.8143          | 6.5016                           |
| 35   | 34.7211          | 30.8663         | 29.4251         | 32.9742                          | 81   | 6.8395           | 5.4693          | 4.4877          | 6.1807                           |
| 36   | 33.9748          | 30.1259         | 28.7590         | 32.2460                          | 82   | 6.5804           | 5.1139          | 4.1778          | 5.8796                           |
| 37   | 33.2268          | 29.3832         | 28.0972         | 31.5170                          | 83   | 6.3354           | 4.7565          | 3.8911          | 5.5889                           |
| 38   | 32.4771          | 28.6398         | 27.4404         | 30.7877                          | 84   | 6.0853           | 4.4033          | 3.6230          | 5.2975                           |
| 39   | 31.7257          | 27.8960         | 26.7900         | 30.0589                          | 85   | 5.8105           | 4.0592          | 3.3730          | 4.9937                           |
| 40   | 30.9724          | 27.1530         | 26.0873         | 29.3306                          | 86   | 5.4905           | 3.7271          | 3.1401          | 4.6652                           |
| 41   | 30.2173          | 26.4113         | 25.5109         | 28.6037                          | 87   | 5.1082           | 3.4063          | 2.9226          | 4.2997                           |
| 42   | 29.4598          | 25.6716         | 24.8841         | 27.8786                          | 88   | 4.6845           | 3.1069          | 2.7219          | 3.9193                           |
| 43   | 28.7018          | 24.9353         | 24.2634         | 27.1555                          | 89   | 4.2447           | 2.8330          | 2.5378          | 3.5424                           |
| 44   | 27.9440          | 24.2041         | 23.6460         | 26.4351                          | 90   | 3.8091           | 2.5861          | 2.3724          | 3.1839                           |
| 45   | 27.1880          | 23.4264         | 23.0299         | 25.7177                          | 91   | 3.3844           | 2.3743          | 2.2263          | 2.8549                           |
| 46   | 26.4340          | 22.7613         | 22.4125         | 25.0034                          | 92   | 2.9879           | 2.2080          | 2.1059          | 2.5663                           |
| 47   | 25.6837          | 22.0523         | 21.7913         | 24.2923                          | 93   | 2.6169           | 2.0729          | 2.0013          | 2.3153                           |
| 48   | 24.5489          | 21.3515         | 21.1687         | 23.5860                          | 94   | 2.2665           | 1.9502          | 1.9034          | 2.0864                           |
| 49   | 24.2000          | 20.6123         | 20.5466         | 22.8856                          | 95   | 1.9394           | 1.8184          | 1.8028          | 1.8694                           |
| 50   | 23.4700          | 19.9733         | 19.9271         | 22.1920                          | 96   | 1.6446           | 1.6675          | 1.6765          | 1.6517                           |
| 51   | 22.7485          | 19.2955         | 19.3113         | 21.5060                          | 97   | 1.3795           | 1.4734          | 1.4607          | 1.4077                           |
| 52   | 22.0379          | 18.6242         | 18.7011         | 20.8282                          | 98   | 1.0668           | 1.2187          | 1.1896          | 1.1542                           |
| 53   | 21.3371          | 17.9629         | 18.0933         | 20.1591                          | 99   | .8476            | .9772           | .9285           | .8861                            |
| 54   | 20.6484          | 17.3144         | 17.4464         | 19.4983                          | 100  | .5000            | .5000           | .5000           | .5000                            |
| 55   | 19.9623          | 16.6810         | 16.8753         | 18.8455                          |      |                  |                 |                 |                                  |



| Age. | EXPECTATION.    |                    | Difference in favour of |           |                    |           |
|------|-----------------|--------------------|-------------------------|-----------|--------------------|-----------|
|      |                 |                    | Town Districts.         |           | England and Wales. |           |
|      | Town Districts. | England and Wales. | In Years.               | Per Cent. | In Years.          | Per Cent. |
| 20   | 42.2742         | 40.6910            | 1.5832                  | 3.888     | .....              | .....     |
| 30   | 34.5743         | 34.0990            | 0.4763                  | 1.397     | .....              | .....     |
| 40   | 27.1530         | 27.4760            | .....                   | .....     | 0.3230             | 1.176     |
| 50   | 19.9733         | 20.8463            | .....                   | .....     | 0.8730             | 4.188     |
| 60   | 13.7608         | 14.5854            | .....                   | .....     | 0.8246             | 5.653     |
| 70   | 8.7030          | 9.2176             | .....                   | .....     | 0.5146             | 5.582     |

The Expectation of Life in the City Districts will be found to be less than in Table D, from age 12 upwards. At 20 the difference is .68 years, at 40 it is 1.39 years, and at 60 the difference is .82 years in favour of the general value of Male Life in Table D. The following gives a comparative view of both Tables:—

| Age. | EXPECTATION.    |                    | Difference in favour of England and Wales. |           |
|------|-----------------|--------------------|--------------------------------------------|-----------|
|      | City Districts. | England and Wales. | In Years.                                  | Per Cent. |
| 20   | 40.0148         | 40.6910            | 0.6762                                     | 1.664     |
| 30   | 32.8603         | 34.0990            | 1.2387                                     | 3.632     |
| 40   | 26.0873         | 27.4760            | 1.3887                                     | 5.054     |
| 50   | 19.9271         | 20.8463            | 0.9192                                     | 4.409     |
| 60   | 13.7685         | 14.5854            | 0.8169                                     | 5.608     |
| 70   | 8.7636          | 9.2176             | 0.4550                                     | 4.092     |

The comparative value of life in the three districts at decennial periods will be seen by an inspection of the following Table; the 6th and 8th columns of which will point out the gradual decrease in the value of Life in moving from the Rural to the Town, and from the Town to the City Districts:—

| Age.              | EXPECTATION OF LIFE. |         |         | Excess in favour of Rural, over |           |                 |           |
|-------------------|----------------------|---------|---------|---------------------------------|-----------|-----------------|-----------|
|                   |                      |         |         | Town Districts.                 |           | City Districts. |           |
|                   | Rural.               | Town.   | City.   | In Years.                       | Per Cent. | In Years.       | Per Cent. |
| 20                | 45.3550              | 42.2742 | 40.0148 | 3.0808                          | 6.790     | 5.3402          | 11.774    |
| 30                | 38.4073              | 34.5753 | 32.8603 | 3.8320                          | 9.977     | 5.5470          | 14.442    |
| 40                | 30.9724              | 27.1530 | 26.0873 | 3.8194                          | 12.331    | 4.8851          | 15.772    |
| 50                | 23.4700              | 19.9733 | 19.9271 | 3.4967                          | 14.900    | 3.5429          | 15.100    |
| 60                | 16.6524              | 13.7608 | 13.7685 | 2.8916                          | 17.364    | 2.8837          | 17.318    |
| 70                | 10.7124              | 8.7030  | 8.7636  | 2.2094                          | 20.246    | 2.1488          | 19.691    |
| Total Excess..... |                      |         |         | 19.3299.....                    |           | 24.3479         |           |

The next arrangement of this kind which will be brought under notice is the Expectation of Life as derived from the combination of all the data composing the three Districts now referred to; and may be understood to represent the general value of Male Life as it exists among the Members of the Community composing Friendly



Societies. Throughout the whole range of this Table the Expectation of Life is found to be higher than among the male population of the country generally. A glance at the following abridgment of Table G, for the three Districts, will shew the difference at the given periods of life:—

| Age. | EXPECTATION IN   |                    | Difference in favour of the Three Districts. |           |
|------|------------------|--------------------|----------------------------------------------|-----------|
|      | Three Districts. | England and Wales. | In Years.                                    | Per Cent. |
| 20   | 43·7736          | 40·6910            | 3·0826                                       | 7·575     |
| 30   | 36·6051          | 34·0990            | 2·5061                                       | 7·349     |
| 40   | 29·3306          | 27·4760            | 1·8546                                       | 6·750     |
| 50   | 22·1920          | 20·8463            | 1·3457                                       | 6·455     |
| 60   | 15·6942          | 14·5854            | 1·1088                                       | 7·602     |
| 70   | 10·2057          | 9·2176             | 0·9881                                       | 10·720    |

A very important distinction is here found to prevail between the value of life in the two Tables. The circumstances in which the humble and working population of the country is placed, have generally been thought adverse to a prolonged duration of life; but the healthiest Life Tables hitherto formed have not shewn any thing so favourable as the present results, even among what are generally considered the select classes of Society:—

It may be well to be understood here, that the persons composing Friendly Societies are almost exclusively the hard-working members of the community, chiefly occupied in the drudgeries and toils of the mechanical arts, and consequently exposed to the inclemencies of seasons, excesses of temperature, impure atmospheres, constrained postures, and other conditions usually thought objectionable. Their incomes are very limited, affording but the scantiest and simplest means of support. Their habitations are of an inferior order, being of the cheapest kind, and consequently in the worst streets. The Members of Friendly Societies are therefore generally placed in those circumstances which persons habituated to the luxuries of the upper ranks of society would regard as unfavourable to health and a superior duration of life. In making these remarks, however, it is necessary, as will hereafter be seen, to make a distinction between them, and the great bulk of the poorer classes of the country. For an individual to remain a Member of a Friendly Society, it is required that he should make his weekly or monthly contribution to its funds; and although a few pence is all that is needed, it presumes on a certain amount of frugality and industrial habit, sufficient to separate him from the reckless and improvident, who are more openly exposed to the vicissitudes—poverty, distress, destitution and disease—incidental to fluctuations in the demand for labour.

The superior value of life among the Members of Friendly Societies is a very remarkable and important feature in this inquiry, and is a result that generally would not have



been anticipated ; and the question which naturally follows is, From what source or class does the excess of mortality, which makes up the general average of the community, arise ?

Those persons having transactions with the Assurance Companies belong, with a very few exceptions, either to the middle or the higher ranks of society ; and if the value of life, as deduced from observations in those Companies, be admitted as a correct measure for such classes, it will be found that their duration of life is not only less than among the Members of Friendly Societies, but also less than in the country generally.

In TABLE H. No. 5, col. 2nd, the Expectation of Life is given as deduced from the aggregate observations of Assurance Companies, and includes both sexes ; but col. 1st (Males *d* 1) of the same Table relates to Male Lives only, and is consequently that which should be brought into comparison with the results of this inquiry.

It may be said, in reply to some of the preceding observations, that the superior value of life in the ranks of Friendly Societies, above the general community, is owing to the effects of selection ; but a little reflection will shew that the difference must be produced by other causes. Every reasonable means is adopted to test the lives admitted into Assurance Companies, and yet they appear to be of less value than the general average of the country ; and Friendly Societies are known *not* to exercise the same degree of scrutiny. In both, the interest of the applicant for admission is opposed to that of the Society ; and, looking at the results, it is not unlikely that the vigilance of the one may be neutralised by the interests of the other. Another result brought out by the observations on the lives in Assurance Offices will shew how inadequate the means of selection usually resorted to are to raise the standard of life above the average of the country. All other inquiries hitherto made on Male and Female Life have tended to attach a greater value to the latter than to the former ; but the results in the Assurance Companies have been reversed, shewing that some other causes, beyond the method of selection, must have interfered to modify the state of health ; for if the means of scrutiny had been adequate to determine the actual character and condition of health, the prevailing feature of each sex would have manifested itself, and the anomalous results of Male Life being of higher absolute value than Female Life not appeared.

Assurance Companies, it has been stated, are likely to have proposals most freely from among unhealthy persons for sums payable at death ; but that proposals for annuities, or sums payable during life, will be made on the lives of the most healthy only ; and that the private opinion of the individual being always brought to bear against the Company, the effects of selection under this aspect ought to prevent the results of such observations from being regarded as a true exponent of the value of life in the class of society generally to which those persons belong. There exists no published document, so far as Assurance Offices are concerned, to shew whether this opinion is well founded : but there is evidence of the same kind—of equal, or perhaps, from its  
[greater



TABLE H.

## EXPECTATION OF LIFE.

| Age. | No. 1.<br>Friendly Societies.<br>Females.<br>Rural, Town, & City. | No. 2.<br>Friendly Societies.<br>Males.<br>Liverpool. | No. 3.<br>Peerage. | Age. | No. 1.<br>Friendly Societies.<br>Females.<br>Rural, Town, & City. | No. 2.<br>Friendly Societies.<br>Males.<br>Liverpool. | No. 3.<br>Peerage. |
|------|-------------------------------------------------------------------|-------------------------------------------------------|--------------------|------|-------------------------------------------------------------------|-------------------------------------------------------|--------------------|
| 10   | 49.4925                                                           | 46.0009                                               | ...                | 56   | 19.9582                                                           | 14.0881                                               | 14.6308            |
| 11   | 49.1826                                                           | 45.1818                                               | ...                | 57   | 19.2966                                                           | 13.5449                                               | 14.0970            |
| 12   | 48.8685                                                           | 44.3597                                               | ...                | 58   | 18.6222                                                           | 12.9960                                               | 13.5737            |
| 13   | 48.5413                                                           | 43.5377                                               | ...                | 59   | 17.9358                                                           | 12.4621                                               | 13.0637            |
| 14   | 48.1921                                                           | 42.7188                                               | ...                | 60   | 17.2380                                                           | 11.9626                                               | 12.5671            |
| 15   | 47.8130                                                           | 41.9006                                               | ...                | 61   | 16.5294                                                           | 11.5151                                               | 12.1091            |
| 16   | 47.3949                                                           | 41.1034                                               | ...                | 62   | 15.8112                                                           | 11.1372                                               | 11.6080            |
| 17   | 46.9305                                                           | 40.3122                                               | ...                | 63   | 15.0965                                                           | 10.8097                                               | 11.1420            |
| 18   | 46.4196                                                           | 39.5276                                               | ...                | 64   | 14.3974                                                           | 10.5137                                               | 10.6830            |
| 19   | 45.8639                                                           | 38.7437                                               | ...                | 65   | 13.7245                                                           | 10.2321                                               | 10.2303            |
| 20   | 45.2640                                                           | 37.9553                                               | 38.4750            | 66   | 13.0869                                                           | 9.9467                                                | 9.7857             |
| 21   | 44.6198                                                           | 37.1574                                               | 37.6614            | 67   | 12.4924                                                           | 9.6407                                                | 9.3518             |
| 22   | 43.9342                                                           | 36.3453                                               | 36.9640            | 68   | 11.9420                                                           | 9.3156                                                | 8.9325             |
| 23   | 43.2191                                                           | 35.5277                                               | 36.1016            | 69   | 11.4333                                                           | 8.9733                                                | 8.5321             |
| 24   | 42.4872                                                           | 34.7124                                               | 35.3445            | 70   | 10.9750                                                           | 8.6156                                                | 8.1506             |
| 25   | 41.7504                                                           | 33.9067                                               | 34.5967            | 71   | 10.5603                                                           | 8.2435                                                | 7.7873             |
| 26   | 41.0194                                                           | 33.1189                                               | 33.8543            | 72   | 10.1940                                                           | 7.8582                                                | 7.4405             |
| 27   | 40.3056                                                           | 32.3541                                               | 33.1200            | 73   | 9.8569                                                            | 7.4648                                                | 7.1102             |
| 28   | 39.6003                                                           | 31.6069                                               | 32.3912            | 74   | 9.5314                                                            | 7.0681                                                | 6.7941             |
| 29   | 38.8956                                                           | 30.8719                                               | 31.6535            | 75   | 9.2001                                                            | 6.6720                                                | 6.4866             |
| 30   | 38.1841                                                           | 30.1437                                               | 30.8760            | 76   | 8.8460                                                            | 6.2793                                                | 6.1883             |
| 31   | 37.4589                                                           | 29.4175                                               | 30.2306            | 77   | 8.4525                                                            | 5.8923                                                | 5.8996             |
| 32   | 36.7129                                                           | 28.6887                                               | 29.5153            | 78   | 8.0339                                                            | 5.5159                                                | 5.6204             |
| 33   | 35.9540                                                           | 27.9612                                               | 28.8023            | 79   | 7.6031                                                            | 5.1531                                                | 5.3506             |
| 34   | 35.1899                                                           | 27.4392                                               | 28.0900            | 80   | 7.1725                                                            | 4.8067                                                | 5.0884             |
| 35   | 34.4280                                                           | 26.5260                                               | 27.3790            | 81   | 6.7518                                                            | 4.4792                                                | 4.8389             |
| 36   | 33.6748                                                           | 25.8251                                               | 26.6700            | 82   | 6.3502                                                            | 4.1715                                                | 4.6016             |
| 37   | 32.9367                                                           | 25.1392                                               | 25.9690            | 83   | 5.9622                                                            | 3.8835                                                | 4.3799             |
| 38   | 32.2103                                                           | 24.4666                                               | 25.1590            | 84   | 5.5817                                                            | 3.6138                                                | 4.1770             |
| 39   | 31.4929                                                           | 23.8050                                               | 24.5830            | 85   | 5.2026                                                            | 3.3621                                                | 3.9958             |
| 40   | 30.7813                                                           | 23.1524                                               | 24.4500            | 86   | 4.8192                                                            | 3.1255                                                | 3.8400             |
| 41   | 30.0735                                                           | 22.5069                                               | 23.2420            | 87   | 4.4232                                                            | 2.9042                                                | 3.7117             |
| 42   | 29.3664                                                           | 21.8666                                               | 22.5921            | 88   | 4.0015                                                            | 2.6978                                                | 3.6076             |
| 43   | 28.6606                                                           | 21.2331                                               | 21.9635            | 89   | 3.5969                                                            | 2.5047                                                | 3.5084             |
| 44   | 27.9567                                                           | 20.6073                                               | 21.3520            | 90   | 3.2186                                                            | 2.3524                                                | 3.4044             |
| 45   | 27.2551                                                           | 19.9908                                               | 20.9494            | 91   | 2.8732                                                            | 2.1971                                                | 3.2729             |
| 46   | 26.5564                                                           | 19.3839                                               | 20.1742            | 92   | 2.5662                                                            | 2.0602                                                | 3.1161             |
| 47   | 25.8611                                                           | 18.6879                                               | 19.6039            | 93   | 2.3144                                                            | 1.9423                                                | 2.8989             |
| 48   | 25.1717                                                           | 18.2059                                               | 19.0404            | 94   | 2.0862                                                            | 1.8292                                                | 2.6338             |
| 49   | 24.4905                                                           | 17.6405                                               | 18.4803            | 95   | 1.8684                                                            | 1.7062                                                | 2.3720             |
| 50   | 23.8200                                                           | 17.0946                                               | 17.9221            | 96   | 1.6495                                                            | 1.5526                                                | 2.1159             |
| 51   | 23.1610                                                           | 16.5705                                               | 17.7590            | 97   | 1.4043                                                            | 1.3750                                                | 1.8689             |
| 52   | 22.5164                                                           | 16.0706                                               | 16.8121            | 98   | 1.1506                                                            | 1.1469                                                | 1.6363             |
| 53   | 21.8795                                                           | 15.5834                                               | 16.2270            | 99   | .8869                                                             | .8750                                                 | 1.4231             |
| 54   | 21.2445                                                           | 15.0975                                               | 15.7137            | 100  | .5000                                                             | .5000                                                 | 1.2142             |
| 55   | 20.6060                                                           | 14.6024                                               | 15.1722            |      |                                                                   |                                                       |                    |



TABLE H.—(continued.)

## EXPECTATION OF LIFE.

| Age. | No. 4.<br>Friendly Societies.<br>16 Trades.<br>Rural Districts.<br>Males. | No. 5.<br>Life Assurance<br>Offices. |            | No. 6.<br>Government.<br>Males. | Age. | No. 4.<br>Friendly Societies.<br>16 Trades.<br>Rural Districts.<br>Males. | No. 5.<br>Life Assurance<br>Offices. |            | No. 6.<br>Government.<br>Males. |
|------|---------------------------------------------------------------------------|--------------------------------------|------------|---------------------------------|------|---------------------------------------------------------------------------|--------------------------------------|------------|---------------------------------|
|      |                                                                           | Males <i>d l</i>                     | Aggregate. |                                 |      |                                                                           | Males <i>d l</i>                     | Aggregate. |                                 |
| 10   | 52.0363                                                                   | ...                                  | ...        | 44.2721                         | 56   | 18.8093                                                                   | 15.66                                | 16.23      | 15.7971                         |
| 11   | 51.1551                                                                   | ...                                  | ...        | 43.5540                         | 57   | 18.1542                                                                   | 15.09                                | 15.62      | 15.2060                         |
| 12   | 50.3863                                                                   | ...                                  | ...        | 42.8244                         | 58   | 17.5052                                                                   | 14.45                                | 14.98      | 14.6188                         |
| 13   | 49.3939                                                                   | ...                                  | ...        | 42.0745                         | 59   | 16.8639                                                                   | 13.99                                | 14.38      | 14.0444                         |
| 14   | 48.5297                                                                   | ...                                  | ...        | 41.3130                         | 60   | 16.2322                                                                   | 13.47                                | 13.81      | 13.4830                         |
| 15   | 47.6860                                                                   | ...                                  | ...        | 40.5612                         | 61   | 15.6110                                                                   | 12.09                                | 13.24      | 12.9379                         |
| 16   | 46.8692                                                                   | ...                                  | ...        | 39.8399                         | 62   | 15.0020                                                                   | 12.46                                | 12.68      | 12.4099                         |
| 17   | 46.0858                                                                   | ...                                  | ...        | 39.1568                         | 63   | 14.4084                                                                   | 11.90                                | 12.09      | 11.8913                         |
| 18   | 45.3321                                                                   | ...                                  | ...        | 38.5202                         | 64   | 13.8333                                                                   | 11.27                                | 11.50      | 11.3770                         |
| 19   | 44.6041                                                                   | ...                                  | ...        | 37.9383                         | 65   | 13.2795                                                                   | 10.87                                | 11.03      | 10.8672                         |
| 20   | 43.8978                                                                   | 39.84                                | 40.97      | 37.4079                         | 66   | 12.7495                                                                   | 10.38                                | 10.51      | 10.3682                         |
| 21   | 43.2102                                                                   | 39.29                                | 40.45      | 36.9217                         | 67   | 12.2454                                                                   | 9.93                                 | 10.03      | 9.8927                          |
| 22   | 42.5377                                                                   | 38.70                                | 39.92      | 36.4565                         | 68   | 11.7598                                                                   | 9.33                                 | 9.46       | 9.4497                          |
| 23   | 41.8756                                                                   | 37.98                                | 39.18      | 36.0047                         | 69   | 11.2856                                                                   | 8.81                                 | 8.99       | 9.0381                          |
| 24   | 41.2197                                                                   | 37.41                                | 38.54      | 35.5502                         | 70   | 10.8160                                                                   | 8.34                                 | 8.50       | 8.6547                          |
| 25   | 40.5657                                                                   | 36.63                                | 37.84      | 35.0806                         | 71   | 10.3441                                                                   | 7.88                                 | 8.13       | 8.2894                          |
| 26   | 39.9096                                                                   | 35.88                                | 37.13      | 34.5912                         | 72   | 9.8643                                                                    | 7.43                                 | 7.72       | 7.9333                          |
| 27   | 39.2472                                                                   | 35.23                                | 36.42      | 34.0772                         | 73   | 9.3862                                                                    | 6.97                                 | 7.26       | 7.5716                          |
| 28   | 38.5785                                                                   | 34.63                                | 35.76      | 33.5421                         | 74   | 8.9188                                                                    | 6.57                                 | 6.84       | 7.1992                          |
| 29   | 37.9028                                                                   | 33.96                                | 35.06      | 32.9896                         | 75   | 8.4698                                                                    | 6.03                                 | 6.46       | 6.8215                          |
| 30   | 37.2237                                                                   | 33.17                                | 34.25      | 32.4192                         | 76   | 8.0465                                                                    | 5.63                                 | 6.08       | 6.4411                          |
| 31   | 36.5380                                                                   | 32.44                                | 33.50      | 31.8346                         | 77   | 7.6552                                                                    | 5.48                                 | 5.77       | 6.0660                          |
| 32   | 35.8464                                                                   | 31.73                                | 32.75      | 31.2315                         | 78   | 7.2976                                                                    | 5.16                                 | 5.37       | 5.7074                          |
| 33   | 35.1492                                                                   | 30.92                                | 31.98      | 30.6097                         | 79   | 6.9750                                                                    | 4.99                                 | 5.07       | 5.3810                          |
| 34   | 34.4464                                                                   | 30.21                                | 31.27      | 29.9689                         | 80   | 6.6900                                                                    | 4.75                                 | 4.75       | 5.0857                          |
| 35   | 33.7378                                                                   | 29.52                                | 30.55      | 29.3167                         | 81   | 6.4455                                                                    | ...                                  | ...        | 4.8093                          |
| 36   | 33.0235                                                                   | 28.87                                | 29.90      | 28.6648                         | 82   | 6.2459                                                                    | ...                                  | ...        | 4.5293                          |
| 37   | 32.3035                                                                   | 28.15                                | 29.20      | 28.0170                         | 83   | 6.0681                                                                    | ...                                  | ...        | 4.2540                          |
| 38   | 31.5766                                                                   | 27.49                                | 28.51      | 27.3846                         | 84   | 5.8879                                                                    | ...                                  | ...        | 3.9906                          |
| 39   | 30.8416                                                                   | 26.81                                | 27.79      | 26.7676                         | 85   | 5.6791                                                                    | ...                                  | ...        | 3.7427                          |
| 40   | 30.0976                                                                   | 26.06                                | 27.07      | 26.1511                         | 86   | 5.4152                                                                    | ...                                  | ...        | 3.5156                          |
| 41   | 29.3439                                                                   | 25.42                                | 26.41      | 25.5311                         | 87   | 5.0692                                                                    | ...                                  | ...        | 3.3039                          |
| 42   | 28.5795                                                                   | 24.70                                | 25.68      | 24.9037                         | 88   | 4.6659                                                                    | ...                                  | ...        | 3.1203                          |
| 43   | 27.8121                                                                   | 24.00                                | 24.98      | 24.2616                         | 89   | 4.2354                                                                    | ...                                  | ...        | 2.9693                          |
| 44   | 27.0490                                                                   | 23.34                                | 24.26      | 23.6006                         | 90   | 3.8023                                                                    | ...                                  | ...        | 2.8233                          |
| 45   | 26.2370                                                                   | 22.63                                | 23.55      | 22.9172                         | 91   | 3.3764                                                                    | ...                                  | ...        | 2.6531                          |
| 46   | 25.5610                                                                   | 21.98                                | 22.85      | 22.2182                         | 92   | 2.9791                                                                    | ...                                  | ...        | 2.4718                          |
| 47   | 24.8486                                                                   | 21.24                                | 22.12      | 21.5103                         | 93   | 2.6054                                                                    | ...                                  | ...        | 2.3000                          |
| 48   | 24.1539                                                                   | 20.62                                | 21.41      | 20.8035                         | 94   | 2.2512                                                                    | ...                                  | ...        | 2.0714                          |
| 49   | 23.4722                                                                   | 20.08                                | 20.79      | 20.1108                         | 95   | 1.9194                                                                    | ...                                  | ...        | 1.7917                          |
| 50   | 22.7993                                                                   | 19.41                                | 20.11      | 19.4414                         | 96   | 1.6126                                                                    | ...                                  | ...        | 1.4375                          |
| 51   | 22.1305                                                                   | 18.73                                | 19.46      | 18.7984                         | 97   | 1.3285                                                                    | ...                                  | ...        | 1.0000                          |
| 52   | 21.4622                                                                   | 18.05                                | 18.79      | 18.1784                         | 98   | 1.0655                                                                    | ...                                  | ...        | .5000                           |
| 53   | 20.7949                                                                   | 17.40                                | 18.16      | 17.5754                         | 99   | .8415                                                                     | ...                                  | ...        | ...                             |
| 54   | 20.1302                                                                   | 16.77                                | 17.50      | 16.9800                         | 100  | .5000                                                                     | ...                                  | ...        | ...                             |
| 55   | 19.4680                                                                   | 16.21                                | 16.83      | 16.3893                         |      |                                                                           |                                      |            |                                 |



greater extent, of higher value than any to be drawn from the Assurance Companies ; it happens, however, that assured lives are of greater instead of less value than those of annuitants. The tables calculated by Mr. Finlaison, on the lives among the nominees of the Government Tontines and Annuity schemes, are here alluded to. The facts over which his observations extended possessed almost every advantage that could be desired ; and, considering the acknowledged skill and care with which his computations were managed, the Government Table must be entitled to the highest confidence, and the Expectation of Life thence deduced regarded as the true measure of life in that particular class of society.

TABLE H, No. 6, has been recalculated for the present paper from the facts given by Mr. Finlaison at page 67 of his Report on Life Annuities in March 1829—being the combined results of six different classes of observations on male lives. That usually quoted as the Expectation Table of the Government Annuitants, is the one calculated by Mr. Finlaison in 1825, and differs in some important particulars from his subsequent and revised data in 1829. This table, then, will shew that the male lives selected for the Government Annuities are not only of less duration than the male population of the country generally, and are also of less value than lives in Assurance Companies, but are actually shorter lived than the members of Friendly Societies in the City Districts. It is evident from those results, that the presumed power of the individual to judge of his own state of health has not shewn the remarkable effects anticipated : there is more reason to believe that the natural inclination with which every person is led to look upon his life as good, will very much influence any power of discrimination on his own chances of longevity. It is, however, to be kept in view, that persons of decidedly bad health will rarely purchase annuities ; and the exclusion of these has, no doubt, some effect in slightly raising the standard of the table. A similar observation is also to be made with respect to the applicants to Assurance Companies. There is a strong temptation for those in really bad, or at least in indifferent health, to offer themselves for assurance ; and if all were admitted, no doubt a lower value would be expressed by the results in Table H, No. 5. The known caution, however, usually exercised in these matters, and the medical talent brought to the aid of the Offices, is a protection against the very worst lives of that class ; about 23 per cent. of the applicants being the average number rejected.

Friendly Societies, although not equally solicitous, are still not without tests for the admission of Members, and they possess one advantage over Assurance Companies ; the Members, and those likely to be candidates, are generally intimately known in their daily habits and ordinary health to each other ; and where evidently bad health exists, admission is refused. A consideration of all that has been advanced will shew that the greater vitality among Members of Friendly Societies cannot be accounted for by the superior mode in the selection of lives ; for, if that argument were carried out to its full extent,



it would go to prove that the other classes in question had, in that respect, the advantage. The blessing thus bestowed on the frugal and industrious workmen of the country composing Friendly Societies, in having granted them, as appears by the present inquiry, a prolonged duration of life, must therefore be regarded as a really true and distinctive feature of that class of persons, and is, no doubt, the result of their simple and uniform habits of life, and the more regular and natural physical exercises to which they are habituated.

If the nature of the present paper led to a further investigation of this point, it could be clearly shewn, by tracing the various classes of society in which there exists sufficient means of subsistence, beginning with the most humble, and passing on to the middle and upper classes, that a gradual deterioration in the duration of life takes place; and that just as life, with all its wealth, pomp, and magnificence, would seem to become more valuable and tempting, so are its opportunities and chances of enjoyment lessened. As far as the results of figures admit of judging, this condition would seem to flow directly from the luxurious and pampered style of living among the wealthier classes, whose artificial habits interfere with the nature and degree of those physical exercises which, in a simpler class of society, are accompanied with a long life.

Thus far, then, it is plain that the amount of life enjoyed by the middle and upper classes tends rather to depreciate than elevate the standard deduced from the general results of the country. And carrying this out still further, and viewing the value of life in the highest ranks of society—namely, the peerage and baronetage—as given in the recent and very interesting paper submitted by Dr. Guy, it will be seen that the Expectation of Life is not only less than in the general community, but also very much below the measure of life *among the Members of Friendly Societies in the CITY DISTRICTS*. The Expectation of Life in the peerage will be found in Table H, No. 3. It may then be conclusively admitted, that the standard of life in the general community is not elevated in any way by the influence of the middle or upper classes. With regard to the very highest ranks, the opposite conclusion must be come to; but as the numbers of the nobility are relatively small, the inferior value of life there shewn is not sufficient to account for the reduction of the scale for the general community so much below the average standard of all classes in Friendly Societies.

It hence follows that the excess of mortality in the general community must fall on the residue of the people; and although at present there exists no direct means of measuring the precise value of life in that portion of the population, it is evident that an inferential one of equal importance is immediately available.

Admitting that the preceding Tables form a correct representation of the value of life in the respective classes, it will be easy to arrive at the value of life in the remaining class; for—



Let Table A represent the rate of mortality in the general community—viz. over all England and Wales;

And let  $b$  = rate of mortality in one class—viz. Friendly Societies—and forming a part of A or included in it;—Also

Let  $c$  = rate of mortality in a second class—viz: the middle and upper classes, and also included in A;—then it is evident that

$A - (b + c)$  = the rate of mortality in the remaining class, composing the Community. And this latter class includes the improvident and reckless, the poor and the destitute, who are exposed to the inclemencies of the seasons, the fluctuations of trade, and fall victims to epidemical and other diseases. Subsequent illustrations will more clearly establish this fact, when the question of large towns or cities is brought under consideration.

In making the preceding comparisons of the mortality of the Rural, Town, and City Districts respectively, with the average results for the whole population of England and Wales, no further corrections of the figures than those described were needed; but before bringing the table representing the combined results of the three districts into comparison with the mortality of the whole population of the country, it would have been important to be enabled to apply a further correction to the elementary data.

An inspection of the arrangement of the data presented in Table E will shew, that if

R, T, and C, represent the population over which the observations in that Table extend, for the Rural, Town, and City Districts respectively and

$r$ ,  $t$ , and  $c$  represent the number of deaths in the same population for the respective districts at each period of life;

then the mortality per cent., and consequently all subsequent results for the average of the three districts, or rather the three districts combined, as set forth in Table E, is derived from—

$$\frac{(r + t + c) \cdot 100}{R + T + C}$$

This is the usual mode by which general averages for various classes of lives have been hitherto determined; but it is evident that unless R, T, and C, bear the same ratio to each other which the whole population of the districts they represent do to each other, the average results cannot be true.

This fact may be rendered more intelligible by the following hypothetical illustration. Suppose at any given age the population over which the actual observations extend was 100 for each of the three districts, viz:—



|              |         |               |       |
|--------------|---------|---------------|-------|
| For District | R = 100 | Annual Deaths | 2     |
| ...          | T = 100 | ...           | 3     |
| ...          | C = 100 | ...           | 4     |
|              | <hr/>   |               | <hr/> |
| R + T + C =  | 300     | ...           | 9     |

then the average result thus derived would shew a mortality of 3 per cent.; but if the whole population of those districts had been to each other in any other relation than an equality of numbers—say 100, 50, and 25—then the number of deaths would have become 2, 1.5, and 1, respectively: consequently, the correct average mortality would have been 2.571 per cent. instead of 3 per cent.

The following mode of obtaining a correct average has also been suggested, but it is obvious that it would involve errors of a more serious nature than the common method employed.

$$\frac{r \cdot 100}{R} + \frac{t \cdot 100}{T} + \frac{c \cdot 100}{C}$$


---


$$3$$

A single illustration will be adequate to point out the fallacies of this.

At age 40—45 the actual mortality of the Rural District is .8361 per cent:

|     |     |                |        |     |
|-----|-----|----------------|--------|-----|
| ... | ... | Town Districts | 1.0637 | ... |
| ... | ... | City Districts | 1.6084 | ... |

Average for the three 1.1694

But supposing the actual population of the whole of each district at that age was in the ratio of 82763, 34220 and 25428, which are the actual numbers in Table E at this term of life, then the correct average mortality of the whole kingdom would be 1.0287 per cent. but the above result was ... .. 1.1694

Difference 0.1407 or an

error on the amount of the true result of 13.7766 per cent.

Although TABLE E, for all the Districts combined, is a correct measure of the average mortality of Friendly Societies in England and Wales, being composed of the actual numbers in those Districts, and in this respect perfect for the purposes of Friendly Societies; yet, unless the numbers representing, at particular years of age, each of the three Districts in TABLE E, bear the same ratio to the combined Districts of that Table, at the same ages which the actual population of the country in each of these Districts has to the whole population of the country at those ages, corrections would be required for purposes of comparison with the general mortality of the kingdom. But for the same reasons that the corrections suggested would improve the Table for comparison with the general mortality of the country, would they also injure the results for the purpose of Friendly Societies. It would, therefore, be better to have the facts under both forms.



As stated in the early part of this paper, if the districts of the Census Commissioners and Registrar-General had been coincident or coterminous, the labour of determining the population at each term of life for the three corresponding Districts would have been well repaid.

As already stated, these observations do not in any way affect the Rates of Mortality as represented in any one District, but affect the combined results for the three Districts only. So far as any individual District is concerned, or the comparison of one District with another, or with the general mortality for the whole kingdom, those objections do not apply, for in respect of locality simple elements only enter into the data of each district.

To some it may appear that too much importance has been given to the nature of this error; but as it so constantly enters, under some aspect or other, into nearly all inquiries into Vital Statistics, frequently producing errors of considerable magnitude, it has been deemed necessary to allude to it at length.

The distinction between the Rates of Mortality in the three Districts has been already pointed out; and so far as a single expression of the value of life among those classes, in given Districts, is required, nothing more is needed; and the difference between the tables will shew the relative value of life in the given Districts. Hitherto it has been thought sufficient to rest at this stage in all inquiries into the influence of locality on the Duration of Life, and to assign the difference thus appearing in the value of life between the respective Districts to the peculiar influence of Town or City Life. Other causes than locality will, however, be shewn to influence the Duration of Life.

If the data composing the facts presented in the preceding Tables be analysed, so as to distinguish one employment from another, it will be found that some occupations are much more healthy than others. The first evidence of this to be brought forward will be confined to the Rural Districts. An inspection of TABLE I, which represents the Mortality of Labourers in the Rural Districts, chiefly agricultural labourers, will shew a much higher specific intensity to the age of 80 than the general results for all employments in the Rural Districts; the specific intensity of Labourers, however, decreases in a gradual and regular series from the youngest ages in the Table, following the rule of the general results of the other Districts, and not presenting the apparent anomaly of the general results for the Rural Districts by shewing an increasing specific intensity from twenty to thirty-one years of age. It will be found that the specific intensity of the General Results for the Rural Districts—

At Age 20 in TABLE F, is as high as age 41 for Labourers in TABLE I;

|     |    |     |    |     |
|-----|----|-----|----|-----|
| ... | 30 | ... | 41 | ... |
| ... | 40 | ... | 44 | ... |
| ... | 50 | ... | 54 | ... |
| ... | 60 | ... | 64 | ... |
| ... | 70 | ... | 72 | ... |

[The Population



TABLE I, No. 1.

RURAL DISTRICTS.—LABOURERS.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 230    | ·2300                  | 434·783                | 56   | 73583   | 1043   | 1·4174                 | 70·572                 |
| 11   | 99770   | 229    | ·2300                  | 434·783                | 57   | 72540   | 1081   | 1·4904                 | 67·114                 |
| 12   | 99541   | 243    | ·2438                  | 410·172                | 58   | 71459   | 1110   | 1·5535                 | 64·350                 |
| 13   | 99298   | 270    | ·2715                  | 368·324                | 59   | 70349   | 1130   | 1·6067                 | 62·228                 |
| 14   | 99028   | 310    | ·3130                  | 319·489                | 60   | 69219   | 1142   | 1·6501                 | 60·606                 |
| 15   | 98718   | 364    | ·3684                  | 271·444                | 61   | 68077   | 1146   | 1·6835                 | 59·382                 |
| 16   | 98354   | 430    | ·4377                  | 228·467                | 62   | 66931   | 1192   | 1·7801                 | 56·180                 |
| 17   | 97924   | 486    | ·4965                  | 201·410                | 63   | 65739   | 1275   | 1·9399                 | 51·546                 |
| 18   | 97438   | 531    | ·5448                  | 183·554                | 64   | 64464   | 1394   | 2·1628                 | 46·232                 |
| 19   | 96907   | 565    | ·5827                  | 171·615                | 65   | 63070   | 1545   | 2·4489                 | 40·833                 |
| 20   | 96342   | 588    | ·6102                  | 163·881                | 66   | 61525   | 1722   | 2·7981                 | 35·740                 |
| 21   | 95754   | 601    | ·6273                  | 159·413                | 67   | 59803   | 1894   | 3·1676                 | 31·566                 |
| 22   | 95153   | 605    | ·6363                  | 157·159                | 68   | 57909   | 2060   | 3·5573                 | 28·114                 |
| 23   | 94548   | 602    | ·6372                  | 156·937                | 69   | 55849   | 2216   | 3·9673                 | 25·208                 |
| 24   | 93946   | 592    | ·6302                  | 158·680                | 70   | 53633   | 2359   | 4·3975                 | 22·738                 |
| 25   | 93354   | 574    | ·6151                  | 162·575                | 71   | 51274   | 2486   | 4·8480                 | 20·627                 |
| 26   | 92780   | 549    | ·5919                  | 168·948                | 72   | 48788   | 2563   | 5·2532                 | 19·037                 |
| 27   | 92231   | 530    | ·5746                  | 174·034                | 73   | 46225   | 2595   | 5·6130                 | 17·816                 |
| 28   | 91701   | 516    | ·5632                  | 177·557                | 74   | 43630   | 2586   | 5·9276                 | 16·869                 |
| 29   | 91185   | 508    | ·5576                  | 179·340                | 75   | 41044   | 2543   | 6·1967                 | 16·137                 |
| 30   | 90677   | 506    | ·5578                  | 179·276                | 76   | 38501   | 2472   | 6·4205                 | 15·574                 |
| 31   | 90171   | 508    | ·5638                  | 177·368                | 77   | 36029   | 2472   | 6·8614                 | 14·575                 |
| 32   | 89663   | 511    | ·5699                  | 175·469                | 78   | 33557   | 2523   | 7·5194                 | 13·300                 |
| 33   | 89152   | 514    | ·5761                  | 173·581                | 79   | 31034   | 2605   | 8·3945                 | 11·912                 |
| 34   | 88638   | 516    | ·5824                  | 171·703                | 80   | 28429   | 2698   | 9·4887                 | 10·539                 |
| 35   | 88122   | 519    | ·5887                  | 169·866                | 81   | 25731   | 2778   | 10·7980                | 9·259                  |
| 36   | 87603   | 521    | ·5950                  | 168·067                | 82   | 22953   | 2691   | 11·7226                | 8·532                  |
| 37   | 87082   | 529    | ·6076                  | 164·582                | 83   | 20262   | 2485   | 12·2626                | 8·157                  |
| 38   | 86553   | 542    | ·6265                  | 159·617                | 84   | 17777   | 2208   | 12·4180                | 8·051                  |
| 39   | 86011   | 560    | ·6515                  | 153·492                | 85   | 15569   | 1897   | 12·1867                | 8·203                  |
| 40   | 85451   | 583    | ·6828                  | 146·456                | 86   | 13672   | 1582   | 11·5728                | 8·643                  |
| 41   | 84868   | 596    | ·7203                  | 138·831                | 87   | 12090   | 1384   | 11·4485                | 8·734                  |
| 42   | 84272   | 634    | ·7522                  | 132·943                | 88   | 10706   | 1282   | 11·9761                | 8·347                  |
| 43   | 83638   | 651    | ·7785                  | 128·452                | 89   | 9424    | 1240   | 13·1556                | 7·599                  |
| 44   | 82987   | 663    | ·7992                  | 125·125                | 90   | 8184    | 1212   | 14·8092                | 6·752                  |
| 45   | 82324   | 670    | ·8143                  | 122·805                | 91   | 6972    | 1207   | 17·3142                | 5·777                  |
| 46   | 81654   | 673    | ·8238                  | 121·389                | 92   | 5765    | 1163   | 20·1724                | 4·958                  |
| 47   | 80981   | 684    | ·8445                  | 118·413                | 93   | 4602    | 1080   | 23·4758                | 4·259                  |
| 48   | 80297   | 704    | ·8762                  | 114·129                | 94   | 3522    | 973    | 27·6246                | 3·620                  |
| 49   | 79593   | 732    | ·9191                  | 108·802                | 95   | 2549    | 837    | 32·8260                | 3·046                  |
| 50   | 78861   | 767    | ·9732                  | 102·754                | 96   | 1712    | 670    | 39·1324                | 2·556                  |
| 51   | 78094   | 811    | 1·0383                 | 96·339                 | 97   | 1042    | 490    | 47·0458                | 2·125                  |
| 52   | 77283   | 856    | 1·1070                 | 90·334                 | 98   | 552     | 319    | 57·7774                | 1·731                  |
| 53   | 76427   | 901    | 1·1793                 | 84·813                 | 99   | 233     | 154    | 66·0370                | 1·514                  |
| 54   | 75526   | 948    | 1·2551                 | 79·681                 | 100  | 79      | 79     | 85·0000                | 1·176                  |
| 55   | 74578   | 995    | 1·3345                 | 74·906                 |      |         |        |                        |                        |



TABLE I, No. 2.

RURAL, TOWN, AND CITY DISTRICTS.—CLERKS.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 396    | ·3961                  | 252·462                | 56   | 42418   | 2422   | 5·7089                 | 17·516                 |
| 11   | 99604   | 395    | ·3961                  | 252·462                | 57   | 39996   | 2506   | 6·2646                 | 15·962                 |
| 12   | 99209   | 401    | ·4038                  | 247·647                | 58   | 37490   | 2464   | 6·5720                 | 15·216                 |
| 13   | 98808   | 414    | ·4193                  | 238·493                | 59   | 35026   | 2323   | 6·6310                 | 15·081                 |
| 14   | 98394   | 435    | ·4425                  | 225·989                | 60   | 32703   | 2107   | 6·4416                 | 15·523                 |
| 15   | 97959   | 464    | ·4735                  | 211·193                | 61   | 30596   | 1837   | 6·0038                 | 16·656                 |
| 16   | 97495   | 499    | ·5123                  | 195·198                | 62   | 28759   | 1631   | 5·6694                 | 17·640                 |
| 17   | 96996   | 576    | ·5937                  | 168·435                | 63   | 27128   | 1475   | 5·4385                 | 18·386                 |
| 18   | 96420   | 692    | ·7180                  | 139·276                | 64   | 25653   | 1362   | 5·3110                 | 18·829                 |
| 19   | 95728   | 847    | ·8849                  | 113·007                | 65   | 24291   | 1284   | 5·2870                 | 18·914                 |
| 20   | 94881   | 1039   | 1·0946                 | 91·324                 | 66   | 23007   | 1235   | 5·3665                 | 18·632                 |
| 21   | 93842   | 1264   | 1·3470                 | 74·239                 | 67   | 21772   | 1201   | 5·5167                 | 18·126                 |
| 22   | 92578   | 1464   | 1·5813                 | 63·251                 | 68   | 20571   | 1180   | 5·7377                 | 17·428                 |
| 23   | 91114   | 1638   | 1·7973                 | 55·648                 | 69   | 19391   | 1169   | 6·0295                 | 16·584                 |
| 24   | 89476   | 1785   | 1·9952                 | 50·125                 | 70   | 18222   | 1153   | 6·3291                 | 15·645                 |
| 25   | 87691   | 1907   | 2·1749                 | 45·977                 | 71   | 17069   | 1165   | 6·8255                 | 14·650                 |
| 26   | 85784   | 2004   | 2·3365                 | 42·790                 | 72   | 15904   | 1161   | 7·2988                 | 13·701                 |
| 27   | 83780   | 2026   | 2·4184                 | 41·356                 | 73   | 14743   | 1152   | 7·8120                 | 12·801                 |
| 28   | 81754   | 1979   | 2·4208                 | 41·305                 | 74   | 13591   | 1137   | 8·3651                 | 11·955                 |
| 29   | 79775   | 1870   | 2·3436                 | 42·662                 | 75   | 12454   | 1116   | 8·9582                 | 11·163                 |
| 30   | 77905   | 1704   | 2·1868                 | 45·725                 | 76   | 11338   | 1088   | 9·5911                 | 10·426                 |
| 31   | 76201   | 1486   | 1·9505                 | 51·256                 | 77   | 10250   | 1062   | 10·3620                | 9·653                  |
| 32   | 74715   | 1317   | 1·7629                 | 56·722                 | 78   | 9188    | 1036   | 11·2708                | 8·873                  |
| 33   | 73398   | 1192   | 1·6240                 | 61·576                 | 79   | 8152    | 1004   | 12·3175                | 8·117                  |
| 34   | 72206   | 1108   | 1·5340                 | 65·189                 | 80   | 7148    | 965    | 13·5021                | 7·407                  |
| 35   | 71098   | 1061   | 1·4927                 | 66·979                 | 81   | 6183    | 917    | 14·8247                | 6·748                  |
| 36   | 70037   | 1051   | 1·5002                 | 66·667                 | 82   | 5266    | 855    | 16·2430                | 6·158                  |
| 37   | 68986   | 1065   | 1·5431                 | 64·809                 | 83   | 4411    | 783    | 17·7573                | 5·631                  |
| 38   | 67921   | 1101   | 1·6215                 | 61·652                 | 84   | 3628    | 703    | 19·3673                | 5·162                  |
| 39   | 66820   | 1160   | 1·7354                 | 57·637                 | 85   | 2925    | 616    | 21·0732                | 4·746                  |
| 40   | 65660   | 1238   | 1·8847                 | 53·050                 | 86   | 2309    | 528    | 22·8750                | 4·371                  |
| 41   | 64422   | 1333   | 2·0694                 | 48·333                 | 87   | 1781    | 442    | 24·8032                | 4·032                  |
| 42   | 63089   | 1388   | 2·1997                 | 45·455                 | 88   | 1339    | 360    | 26·8580                | 3·723                  |
| 43   | 61701   | 1404   | 2·2754                 | 43·956                 | 89   | 979     | 284    | 29·0393                | 3·444                  |
| 44   | 60297   | 1385   | 2·2967                 | 43·535                 | 90   | 695     | 218    | 31·3471                | 3·190                  |
| 45   | 58912   | 1333   | 2·2634                 | 44·189                 | 91   | 477     | 161    | 33·7814                | 2·960                  |
| 46   | 57579   | 1253   | 2·1756                 | 45·956                 | 92   | 316     | 114    | 36·0243                | 2·776                  |
| 47   | 56326   | 1215   | 2·1572                 | 46·361                 | 93   | 202     | 77     | 38·0758                | 2·626                  |
| 48   | 55111   | 1217   | 2·2083                 | 45·290                 | 94   | 125     | 50     | 39·9359                | 2·504                  |
| 49   | 53894   | 1255   | 2·3287                 | 42·937                 | 95   | 75      | 31     | 41·6047                | 2·404                  |
| 50   | 52639   | 1326   | 2·5186                 | 39·698                 | 96   | 44      | 19     | 43·0820                | 2·321                  |
| 51   | 51313   | 1426   | 2·7780                 | 35·997                 | 97   | 25      | 12     | 47·3179                | 2·113                  |
| 52   | 49837   | 1570   | 3·1462                 | 31·786                 | 98   | 13      | 7      | 53·9970                | 1·852                  |
| 53   | 48317   | 1751   | 3·6235                 | 27·594                 | 99   | 6       | 4      | 61·3067                | 1·631                  |
| 54   | 46566   | 1960   | 4·2097                 | 23·753                 | 100  | 2       | 2      | 75·0000                | 1·333                  |
| 55   | 44606   | 2188   | 4·9048                 | 20·387                 |      |         |        |                        |                        |



TABLE I, No. 3.

RURAL, TOWN, AND CITY DISTRICTS.—PLUMBERS, PAINTERS, &c.—*Males*.

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 350    | ·3499                  | 285·796                | 56   | 51301   | 1952   | 3·8051                 | 26·281                 |
| 11   | 99650   | 349    | ·3499                  | 285·796                | 57   | 49349   | 1933   | 3·9167                 | 25·530                 |
| 12   | 99301   | 416    | ·4192                  | 238·550                | 58   | 47416   | 1956   | 4·1240                 | 24·248                 |
| 13   | 98885   | 552    | ·5579                  | 179·244                | 59   | 45460   | 2021   | 4·4467                 | 22·487                 |
| 14   | 98333   | 753    | ·7659                  | 130·565                | 60   | 43439   | 2131   | 4·9050                 | 20·387                 |
| 15   | 97580   | 1018   | 1·0432                 | 95·877                 | 61   | 41308   | 2263   | 5·4789                 | 18·252                 |
| 16   | 96562   | 1342   | 1·3899                 | 71·942                 | 62   | 39045   | 2345   | 6·0046                 | 16·653                 |
| 17   | 95220   | 1538   | 1·6148                 | 61·920                 | 63   | 36700   | 2386   | 6·5022                 | 15·380                 |
| 18   | 93682   | 1609   | 1·7179                 | 58·207                 | 64   | 34314   | 2385   | 6·9518                 | 14·384                 |
| 19   | 92073   | 1565   | 1·6993                 | 58·858                 | 65   | 31929   | 2341   | 7·3332                 | 13·637                 |
| 20   | 90508   | 1411   | 1·5588                 | 64·144                 | 66   | 29588   | 2268   | 7·6666                 | 13·043                 |
| 21   | 89097   | 1155   | 1·2966                 | 77·101                 | 67   | 27320   | 2154   | 7·8836                 | 12·684                 |
| 22   | 87942   | 961    | 1·0932                 | 91·491                 | 68   | 25166   | 2009   | 7·9844                 | 12·525                 |
| 23   | 86981   | 825    | ·9485                  | 105·430                | 69   | 23157   | 1845   | 7·9689                 | 12·549                 |
| 24   | 86156   | 743    | ·8627                  | 115·915                | 70   | 21312   | 1670   | 7·8371                 | 12·760                 |
| 25   | 85413   | 714    | ·8357                  | 119·660                | 71   | 19642   | 1491   | 7·5890                 | 13·177                 |
| 26   | 84699   | 735    | ·8674                  | 115·287                | 72   | 18151   | 1352   | 7·4474                 | 13·428                 |
| 27   | 83964   | 776    | ·9246                  | 108·155                | 73   | 16799   | 1245   | 7·4122                 | 13·492                 |
| 28   | 83188   | 838    | 1·0071                 | 99·305                 | 74   | 15554   | 1164   | 7·4835                 | 13·362                 |
| 29   | 82350   | 918    | 1·1150                 | 89·686                 | 75   | 14390   | 1103   | 7·6612                 | 13·053                 |
| 30   | 81432   | 1016   | 1·2482                 | 80·128                 | 76   | 13287   | 1061   | 7·9455                 | 12·585                 |
| 31   | 80416   | 1131   | 1·4068                 | 71·073                 | 77   | 12226   | 1019   | 8·3358                 | 11·996                 |
| 32   | 79285   | 1195   | 1·5068                 | 66·357                 | 78   | 11207   | 990    | 8·8322                 | 11·322                 |
| 33   | 78090   | 1209   | 1·5480                 | 64·599                 | 79   | 10217   | 964    | 9·4347                 | 10·600                 |
| 34   | 76881   | 1177   | 1·5306                 | 65·317                 | 80   | 9353    | 949    | 10·1433                | 9·862                  |
| 35   | 75704   | 1101   | 1·4546                 | 68·729                 | 81   | 8404    | 921    | 10·9580                | 9·124                  |
| 36   | 74603   | 985    | 1·3198                 | 75·758                 | 82   | 7483    | 872    | 11·6514                | 8·584                  |
| 37   | 73618   | 908    | 1·2335                 | 81·103                 | 83   | 6611    | 808    | 12·2236                | 8·183                  |
| 38   | 72710   | 869    | 1·1956                 | 83·612                 | 84   | 5803    | 736    | 12·6744                | 7·893                  |
| 39   | 71841   | 867    | 1·2062                 | 82·919                 | 85   | 5067    | 659    | 13·0040                | 7·692                  |
| 40   | 70974   | 898    | 1·2651                 | 79·051                 | 86   | 4408    | 582    | 13·2123                | 7·570                  |
| 41   | 70076   | 962    | 1·3725                 | 72·833                 | 87   | 3826    | 536    | 14·0171                | 7·133                  |
| 42   | 69114   | 987    | 1·4287                 | 69·979                 | 88   | 3290    | 507    | 15·4183                | 6·485                  |
| 43   | 68127   | 977    | 1·4336                 | 69·735                 | 89   | 2783    | 485    | 17·4160                | 5·741                  |
| 44   | 67150   | 932    | 1·3874                 | 72·098                 | 90   | 2298    | 460    | 20·0101                | 4·998                  |
| 45   | 66218   | 854    | 1·2899                 | 77·519                 | 91   | 1838    | 426    | 23·2007                | 4·310                  |
| 46   | 65364   | 746    | 1·1412                 | 87·642                 | 92   | 1412    | 373    | 26·4114                | 3·786                  |
| 47   | 64618   | 737    | 1·1411                 | 87·642                 | 93   | 1039    | 308    | 29·6421                | 3·374                  |
| 48   | 63881   | 824    | 1·2897                 | 77·519                 | 94   | 731     | 240    | 32·8930                | 3·040                  |
| 49   | 63057   | 1001   | 1·5870                 | 63·012                 | 95   | 491     | 178    | 36·1639                | 2·765                  |
| 50   | 62056   | 1262   | 2·0329                 | 49·188                 | 96   | 313     | 124    | 39·4548                | 2·535                  |
| 51   | 60794   | 1597   | 2·6275                 | 38·052                 | 97   | 189     | 85     | 45·1416                | 2·215                  |
| 52   | 59197   | 1837   | 3·1024                 | 32·237                 | 98   | 104     | 55     | 52·9088                | 1·890                  |
| 53   | 57360   | 1983   | 3·4576                 | 28·918                 | 99   | 49      | 30     | 61·3067                | 1·631                  |
| 54   | 55377   | 2045   | 3·6931                 | 27·078                 | 100  | 19      | 19     | 75·0000                | 1·333                  |
| 55   | 53332   | 2031   | 3·8089                 | 26·254                 |      |         |        |                        |                        |



## DURATION OF LIFE

TABLE I, No. 4.

RURAL, TOWN, AND CITY DISTRICTS.—BAKERS.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 396    | ·3961                  | 252·462                | 56   | 55501   | 1538   | 2·7705                 | 36·088                 |
| 11   | 99604   | 395    | ·3961                  | 252·462                | 57   | 53963   | 1555   | 2·8822                 | 34·698                 |
| 12   | 99209   | 401    | ·4038                  | 247·647                | 58   | 52408   | 1560   | 2·9758                 | 33·602                 |
| 13   | 98808   | 415    | ·4193                  | 238·493                | 59   | 50848   | 1552   | 3·0512                 | 32·776                 |
| 14   | 98393   | 435    | ·4425                  | 225·989                | 60   | 49296   | 1532   | 3·1085                 | 32·165                 |
| 15   | 97958   | 464    | ·4735                  | 211·193                | 61   | 47764   | 1503   | 3·1476                 | 31·766                 |
| 16   | 97494   | 499    | ·5123                  | 195·198                | 62   | 46261   | 1513   | 3·2709                 | 30·572                 |
| 17   | 96995   | 521    | ·5368                  | 186·289                | 63   | 44748   | 1557   | 3·4783                 | 28·752                 |
| 18   | 96474   | 528    | ·5472                  | 182·749                | 64   | 43191   | 1628   | 3·7699                 | 26·525                 |
| 19   | 95946   | 521    | ·5435                  | 183·993                | 65   | 41563   | 1723   | 4·1456                 | 24·120                 |
| 20   | 95425   | 501    | ·5255                  | 190·295                | 66   | 39840   | 1835   | 4·6055                 | 21·711                 |
| 21   | 94924   | 468    | ·4934                  | 202·675                | 67   | 38005   | 1923   | 5·0601                 | 19·763                 |
| 22   | 94456   | 461    | ·4877                  | 205·044                | 68   | 36082   | 1988   | 5·5094                 | 18·152                 |
| 23   | 93995   | 478    | ·5084                  | 196·696                | 69   | 34094   | 2030   | 5·9534                 | 16·798                 |
| 24   | 93517   | 519    | ·5555                  | 180·018                | 70   | 32064   | 2050   | 6·3921                 | 15·645                 |
| 25   | 92998   | 585    | ·6290                  | 158·983                | 71   | 30014   | 2049   | 6·8254                 | 14·652                 |
| 26   | 92413   | 674    | ·7289                  | 137·193                | 72   | 27965   | 2041   | 7·2987                 | 13·701                 |
| 27   | 91739   | 743    | ·8103                  | 123·411                | 73   | 25924   | 2025   | 7·8119                 | 12·801                 |
| 28   | 90996   | 793    | ·8733                  | 114·508                | 74   | 23899   | 1999   | 8·3651                 | 11·955                 |
| 29   | 90203   | 828    | ·9177                  | 108·968                | 75   | 21900   | 1962   | 8·9581                 | 11·163                 |
| 30   | 89375   | 843    | ·9437                  | 105·966                | 76   | 19938   | 1912   | 9·5911                 | 10·426                 |
| 31   | 88532   | 842    | ·9512                  | 105·130                | 77   | 18026   | 1868   | 10·3620                | 9·653                  |
| 32   | 87690   | 815    | ·9297                  | 107·562                | 78   | 16158   | 1821   | 11·2708                | 8·873                  |
| 33   | 86875   | 764    | ·8791                  | 113·753                | 79   | 14337   | 1766   | 12·3175                | 8·117                  |
| 34   | 86111   | 689    | ·7996                  | 125·063                | 80   | 12571   | 1697   | 13·5021                | 7·407                  |
| 35   | 85422   | 590    | ·6911                  | 144·697                | 81   | 10874   | 1652   | 14·8247                | 6·748                  |
| 36   | 84832   | 470    | ·5535                  | 180·669                | 82   | 9282    | 1508   | 16·2430                | 6·158                  |
| 37   | 84362   | 405    | ·4804                  | 208·160                | 83   | 7774    | 1381   | 17·7573                | 5·631                  |
| 38   | 83957   | 396    | ·4714                  | 212·134                | 84   | 6393    | 1238   | 19·3673                | 5·163                  |
| 39   | 83561   | 441    | ·5272                  | 189·681                | 85   | 5155    | 1086   | 21·0732                | 4·746                  |
| 40   | 83120   | 538    | ·6471                  | 154·536                | 86   | 4069    | 931    | 22·8750                | 4·370                  |
| 41   | 82582   | 687    | ·8314                  | 120·279                | 87   | 3138    | 778    | 24·8032                | 4·032                  |
| 42   | 81895   | 903    | 1·1026                 | 90·662                 | 88   | 2360    | 634    | 26·8580                | 3·723                  |
| 43   | 80992   | 1183   | 1·4607                 | 68·446                 | 89   | 1726    | 501    | 29·0393                | 3·444                  |
| 44   | 79809   | 1518   | 1·9058                 | 52·466                 | 90   | 1225    | 384    | 31·3471                | 3·190                  |
| 45   | 78291   | 1909   | 2·4377                 | 41·017                 | 91   | 841     | 284    | 33·7814                | 2·960                  |
| 46   | 76382   | 2335   | 3·0566                 | 32·712                 | 92   | 557     | 201    | 36·0243                | 2·776                  |
| 47   | 74047   | 2573   | 3·4752                 | 28·777                 | 93   | 356     | 136    | 38·0758                | 2·626                  |
| 48   | 71474   | 2640   | 3·6934                 | 27·078                 | 94   | 220     | 87     | 39·9359                | 2·504                  |
| 49   | 68834   | 2555   | 3·7114                 | 26·947                 | 95   | 133     | 55     | 41·6047                | 2·404                  |
| 50   | 66279   | 2339   | 3·5290                 | 28·337                 | 96   | 78      | 33     | 43·0820                | 2·321                  |
| 51   | 63940   | 2012   | 3·1463                 | 31·786                 | 97   | 45      | 21     | 47·3179                | 2·113                  |
| 52   | 61928   | 1775   | 2·8661                 | 34·892                 | 98   | 24      | 12     | 53·9970                | 1·852                  |
| 53   | 60153   | 1617   | 2·6884                 | 37·202                 | 99   | 12      | 8      | 61·3067                | 1·631                  |
| 54   | 58536   | 1530   | 2·6133                 | 38·270                 | 100  | 4       | 4      | 75·0000                | 1·333                  |
| 55   | 57006   | 1505   | 2·6406                 | 37·864                 |      |         |        |                        |                        |



TABLE I, No. 5.

RURAL, TOWN, AND CITY DISTRICTS.—MINERS.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 396    | ·3961                  | 252·462                | 56   | 63960   | 2177   | 3·4036                 | 29·377                 |
| 11   | 99604   | 395    | ·3961                  | 252·462                | 57   | 61783   | 2371   | 3·8368                 | 26·062                 |
| 12   | 99209   | 401    | ·4038                  | 247·647                | 58   | 59412   | 2558   | 4·3057                 | 23·223                 |
| 13   | 98808   | 414    | ·4193                  | 238·493                | 59   | 56854   | 2735   | 4·8104                 | 20·790                 |
| 14   | 98394   | 435    | ·4425                  | 225·989                | 60   | 54119   | 2896   | 5·3509                 | 18·688                 |
| 15   | 97959   | 464    | ·4735                  | 211·193                | 61   | 51223   | 3036   | 5·9271                 | 16·872                 |
| 16   | 97495   | 499    | ·5123                  | 195·198                | 62   | 48187   | 3064   | 6·3575                 | 15·728                 |
| 17   | 96996   | 540    | ·5567                  | 179·630                | 63   | 45123   | 2997   | 6·6422                 | 15·056                 |
| 18   | 96456   | 585    | ·6070                  | 164·745                | 64   | 42126   | 2857   | 6·7810                 | 14·747                 |
| 19   | 95871   | 636    | ·6630                  | 150·830                | 65   | 39269   | 2660   | 6·7740                 | 14·762                 |
| 20   | 95235   | 690    | ·7247                  | 137·988                | 66   | 36609   | 2424   | 6·6213                 | 15·103                 |
| 21   | 94545   | 749    | ·7922                  | 126·231                | 67   | 34185   | 2241   | 6·5541                 | 15·258                 |
| 22   | 93796   | 772    | ·8228                  | 121·536                | 68   | 31944   | 2100   | 6·5726                 | 15·214                 |
| 23   | 93024   | 759    | ·8164                  | 122·489                | 69   | 29844   | 1993   | 6·6767                 | 14·977                 |
| 24   | 92265   | 713    | ·7731                  | 129·349                | 70   | 27851   | 1912   | 6·8664                 | 14·564                 |
| 25   | 91552   | 634    | ·6929                  | 144·321                | 71   | 25939   | 1853   | 7·1417                 | 14·002                 |
| 26   | 90918   | 524    | ·5758                  | 173·671                | 72   | 24086   | 1804   | 7·4885                 | 13·353                 |
| 27   | 90394   | 450    | ·4976                  | 200·965                | 73   | 22282   | 1762   | 7·9069                 | 12·647                 |
| 28   | 89944   | 412    | ·4582                  | 218·245                | 74   | 20520   | 1723   | 8·3967                 | 11·909                 |
| 29   | 89532   | 410    | ·4577                  | 218·484                | 75   | 18897   | 1693   | 8·9582                 | 11·163                 |
| 30   | 89122   | 442    | ·4960                  | 201·613                | 76   | 17204   | 1650   | 9·5911                 | 10·426                 |
| 31   | 88680   | 508    | ·5732                  | 174·459                | 77   | 15554   | 1612   | 10·3620                | 9·653                  |
| 32   | 88172   | 552    | ·6262                  | 159·693                | 78   | 13942   | 1571   | 11·2708                | 8·873                  |
| 33   | 87620   | 574    | ·6549                  | 152·695                | 79   | 12371   | 1524   | 12·3175                | 8·117                  |
| 34   | 87046   | 574    | ·6594                  | 151·653                | 80   | 10847   | 1465   | 13·5021                | 7·407                  |
| 35   | 86472   | 553    | ·6397                  | 156·323                | 81   | 9382    | 1391   | 14·8247                | 6·748                  |
| 36   | 85919   | 512    | ·5957                  | 167·870                | 82   | 7991    | 1298   | 16·2430                | 6·158                  |
| 37   | 85407   | 496    | ·5813                  | 172·028                | 83   | 6693    | 1189   | 17·7573                | 5·631                  |
| 38   | 84911   | 506    | ·5963                  | 167·701                | 84   | 5504    | 1066   | 19·3673                | 5·163                  |
| 39   | 84405   | 541    | ·6408                  | 156·055                | 85   | 4438    | 935    | 21·0732                | 4·746                  |
| 40   | 83864   | 599    | ·7147                  | 139·919                | 86   | 3503    | 801    | 22·8750                | 4·371                  |
| 41   | 83265   | 679    | ·8181                  | 122·234                | 87   | 2702    | 670    | 24·8032                | 4·032                  |
| 42   | 82586   | 769    | ·9308                  | 107·435                | 88   | 2032    | 546    | 26·8580                | 3·723                  |
| 43   | 81817   | 861    | 1·0527                 | 94·967                 | 89   | 1486    | 432    | 29·0393                | 3·444                  |
| 44   | 80956   | 959    | 1·1840                 | 84·459                 | 90   | 1054    | 330    | 31·3471                | 3·190                  |
| 45   | 79997   | 1060   | 1·3246                 | 75·472                 | 91   | 724     | 245    | 33·7814                | 2·960                  |
| 46   | 78937   | 1164   | 1·4744                 | 67·843                 | 92   | 479     | 173    | 36·0243                | 2·776                  |
| 47   | 77773   | 1254   | 1·6118                 | 62·035                 | 93   | 306     | 117    | 38·0758                | 2·626                  |
| 48   | 76519   | 1329   | 1·7367                 | 57·571                 | 94   | 189     | 75     | 39·9359                | 2·504                  |
| 49   | 75190   | 1390   | 1·8491                 | 54·083                 | 95   | 114     | 47     | 41·6047                | 2·404                  |
| 50   | 73800   | 1438   | 1·9490                 | 51·308                 | 96   | 67      | 29     | 43·0820                | 2·321                  |
| 51   | 72362   | 1474   | 2·0364                 | 49·116                 | 97   | 38      | 18     | 47·3179                | 2·113                  |
| 52   | 70888   | 1549   | 2·1858                 | 45·746                 | 98   | 20      | 11     | 53·9970                | 1·852                  |
| 53   | 69339   | 1588   | 2·3973                 | 41·719                 | 99   | 9       | 6      | 61·3067                | 1·631                  |
| 54   | 67751   | 1809   | 2·6707                 | 37·439                 | 100  | 3       | 3      | 75·0000                | 1·333                  |
| 55   | 65942   | 1982   | 3·0061                 | 33·267                 |      |         |        |                        |                        |



TABLE I, No. 6.

RESIDUE, BY ABSTRACTING LABOURERS FROM RURAL DISTRICTS.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 230    | ·2300                  | 434·783                | 56   | 65081   | 1233   | 1·8948                 | 52·770                 |
| 11   | 99770   | 229    | ·2300                  | 434·783                | 57   | 63848   | 1276   | 1·9987                 | 50·025                 |
| 12   | 99541   | 275    | ·2764                  | 361·795                | 58   | 62572   | 1328   | 2·1231                 | 47·103                 |
| 13   | 99266   | 367    | ·3693                  | 270·783                | 59   | 61244   | 1389   | 2·2681                 | 44·092                 |
| 14   | 98899   | 503    | ·5085                  | 196·657                | 60   | 59855   | 1456   | 2·4336                 | 41·085                 |
| 15   | 98396   | 683    | ·6943                  | 144·030                | 61   | 58399   | 1529   | 2·6197                 | 38·168                 |
| 16   | 97713   | 905    | ·9264                  | 107·945                | 62   | 56870   | 1609   | 2·8309                 | 35·323                 |
| 17   | 96808   | 1051   | 1·0886                 | 91·827                 | 63   | 55261   | 1695   | 3·0672                 | 32·605                 |
| 18   | 95757   | 1124   | 1·1747                 | 85·106                 | 64   | 53566   | 1783   | 3·3286                 | 30·039                 |
| 19   | 94633   | 1126   | 1·1908                 | 83·963                 | 65   | 51783   | 1876   | 3·6151                 | 27·662                 |
| 20   | 93507   | 1061   | 1·1349                 | 88·106                 | 66   | 49907   | 1959   | 3·9267                 | 25·465                 |
| 21   | 92446   | 932    | 1·0070                 | 99·305                 | 67   | 47948   | 2039   | 4·2541                 | 23·507                 |
| 22   | 91514   | 830    | ·9065                  | 110·314                | 68   | 45909   | 2110   | 4·5972                 | 21·753                 |
| 23   | 90684   | 756    | ·8335                  | 119·976                | 69   | 43799   | 2170   | 4·9562                 | 20·178                 |
| 24   | 89928   | 709    | ·7880                  | 126·904                | 70   | 41629   | 2219   | 5·3310                 | 18·758                 |
| 25   | 89219   | 687    | ·7699                  | 129·887                | 71   | 39410   | 2254   | 5·7215                 | 17·476                 |
| 26   | 88532   | 690    | ·7793                  | 128·320                | 72   | 37156   | 2269   | 6·1079                 | 16·372                 |
| 27   | 87842   | 690    | ·7852                  | 127·356                | 73   | 34887   | 2264   | 6·4900                 | 15·408                 |
| 28   | 87152   | 687    | ·7877                  | 126·952                | 74   | 32623   | 2240   | 6·8680                 | 14·560                 |
| 29   | 86465   | 680    | ·7867                  | 127·113                | 75   | 30383   | 2200   | 7·2417                 | 13·808                 |
| 30   | 85785   | 671    | ·7823                  | 127·828                | 76   | 28183   | 2145   | 7·6112                 | 13·139                 |
| 31   | 85114   | 659    | ·7744                  | 129·132                | 77   | 26038   | 2090   | 8·0283                 | 12·456                 |
| 32   | 84455   | 651    | ·7713                  | 129·651                | 78   | 23948   | 2033   | 8·4929                 | 11·774                 |
| 33   | 83804   | 648    | ·7731                  | 129·349                | 79   | 21915   | 1973   | 9·0051                 | 11·105                 |
| 34   | 83156   | 648    | ·7797                  | 128·255                | 80   | 19942   | 1907   | 9·5649                 | 10·455                 |
| 35   | 82508   | 653    | ·7912                  | 126·390                | 81   | 18035   | 1830   | 10·1723                | 9·833                  |
| 36   | 81855   | 661    | ·8075                  | 123·839                | 82   | 16205   | 1729   | 10·6987                | 9·346                  |
| 37   | 81194   | 666    | ·8208                  | 121·832                | 83   | 14476   | 1600   | 11·0564                | 9·042                  |
| 38   | 80528   | 669    | ·8312                  | 120·308                | 84   | 12876   | 1445   | 11·2253                | 8·905                  |
| 39   | 79859   | 670    | ·8387                  | 119·232                | 85   | 11431   | 1290   | 11·2924                | 8·857                  |
| 40   | 79189   | 668    | ·8432                  | 118·596                | 86   | 10141   | 1153   | 11·3768                | 8·787                  |
| 41   | 78521   | 663    | ·8447                  | 118·385                | 87   | 8988    | 1049   | 11·6788                | 8·562                  |
| 42   | 77858   | 669    | ·8589                  | 116·428                | 88   | 7939    | 982    | 12·3700                | 8·084                  |
| 43   | 77189   | 684    | ·8858                  | 112·892                | 89   | 6957    | 948    | 13·6294                | 7·337                  |
| 44   | 76505   | 708    | ·9252                  | 108·085                | 90   | 6009    | 928    | 15·4410                | 6·477                  |
| 45   | 75797   | 741    | ·9773                  | 102·323                | 91   | 5081    | 903    | 17·7744                | 5·627                  |
| 46   | 75056   | 782    | 1·0421                 | 95·969                 | 92   | 4178    | 864    | 20·6794                | 4·836                  |
| 47   | 74274   | 827    | 1·1128                 | 89·847                 | 93   | 3314    | 805    | 24·2828                | 4·119                  |
| 48   | 73447   | 874    | 1·1895                 | 84·034                 | 94   | 2509    | 719    | 28·6464                | 3·490                  |
| 49   | 72573   | 923    | 1·2723                 | 78·616                 | 95   | 1790    | 609    | 34·0210                | 2·939                  |
| 50   | 71650   | 975    | 1·3610                 | 73·475                 | 96   | 1181    | 483    | 40·8812                | 2·446                  |
| 51   | 70675   | 1029   | 1·4565                 | 68·634                 | 97   | 698     | 339    | 48·5636                | 2·059                  |
| 52   | 69646   | 1078   | 1·5481                 | 64·599                 | 98   | 359     | 212    | 58·9984                | 1·695                  |
| 53   | 68568   | 1123   | 1·6383                 | 61·050                 | 99   | 147     | 97     | 66·0370                | 1·514                  |
| 54   | 67445   | 1164   | 1·7261                 | 57·937                 | 100  | 50      | 50     | 85·0000                | 1·176                  |
| 55   | 66281   | 1200   | 1·8116                 | 55·188                 |      |         |        |                        |                        |



The Population in TABLE F was shewn to be bisected at ages 68-9, while among the Labourers that will be seen to take place at ages 71-2. The sum of the series of differences of the points of equal specific intensity between the Rural, Town, and City Districts respectively, and Table C, were shewn to be 55, 23, and 5; but the sum of the same order of differences for Table I is 78; so that the difference between Labourers and the General Results for the Rural Districts is more than equivalent to the mean difference between Towns and Cities and the Rural Districts. It will also be seen that the sum of the series of differences of the points of equal specific intensity in the Rural Districts generally, and the Labourers, is 46, being above the mean of 55 and 23.

The difference for the equation of life to

Age 10, between Rural and Town Districts, is 4 years.

...      ...      Town and City      ...      3      ...  
and      ...      Labourers and Rural      ...      3      ...

So that, in this general way of viewing the question, employment produces as wide a distinction as locality.

If TABLE J is now referred to, it will be seen that the Expectation of Life among Labourers in the Rural Districts exceeds the Expectation of the Rural Districts generally throughout the whole term of life. At decennial ages the following is the relative value of life.

| Age. | Rural Districts.       |                  | Difference in favour of Labourers. |           | Age. |
|------|------------------------|------------------|------------------------------------|-----------|------|
|      | General Results.<br>G. | Labourers.<br>J. | In Years.                          | Per Cent. |      |
| 20   | 45·3550                | 47·9063          | 2·5513                             | 5·6251    | 20   |
| 30   | 38·4073                | 40·5972          | 2·1899                             | 5·7017    | 30   |
| 40   | 30·9724                | 32·7693          | 1·7969                             | 5·8016    | 40   |
| 50   | 23·4700                | 25·0745          | 1·6045                             | 6·8500    | 50   |
| 60   | 16·6524                | 17·8205          | 1·1681                             | 7·8146    | 60   |
| 70   | 10·9124                | 11·3498          | 0·4374                             | 4·0072    | 70   |

The preceding arrangements, however, do not shew the full influence of employment on health, or rather that of an individual employment on health; for, in making comparisons of classes with any standard, that standard ought not to include the class held in comparison, but be the residue left by abstracting that class from the general results; otherwise the effect of that class, in changing the integral expression, will not be seen to its full extent, and the concealment of the real difference will be the greater in proportion to the



## DURATION OF LIFE

TABLE J.

## EXPECTATION OF LIFE.

| Age. | No. 1.<br>Labourers.<br>Rural Districts. | No. 2.<br>Clerks.<br>Rural Districts,<br>Towns & Cities. | No. 3.<br>Plumbers,<br>Painters, &c.<br>Rural Districts,<br>Towns & Cities. | Age. | No. 1.<br>Labourers.<br>Rural Districts. | No. 2.<br>Clerks.<br>Rural Districts,<br>Towns & Cities. | No. 3.<br>Plumbers,<br>Painters, &c.<br>Rural Districts,<br>Towns & Cities. |
|------|------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------|------|------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------|
| 10   | 56.0054                                  | 39.9856                                                  | 43.0665                                                                     | 56   | 20.6469                                  | 13.1183                                                  | 13.9984                                                                     |
| 11   | 55.1333                                  | 39.1425                                                  | 42.2160                                                                     | 57   | 19.8919                                  | 12.8824                                                  | 13.5324                                                                     |
| 12   | 54.2590                                  | 38.2964                                                  | 41.3626                                                                     | 58   | 19.2307                                  | 12.7101                                                  | 13.0637                                                                     |
| 13   | 53.3907                                  | 37.4498                                                  | 40.5345                                                                     | 59   | 18.5262                                  | 12.5691                                                  | 12.6043                                                                     |
| 14   | 52.5348                                  | 36.6053                                                  | 39.7593                                                                     | 60   | 17.8205                                  | 12.4264                                                  | 12.1675                                                                     |
| 15   | 51.6982                                  | 35.7656                                                  | 39.0622                                                                     | 61   | 17.1110                                  | 12.2477                                                  | 11.7694                                                                     |
| 16   | 50.8876                                  | 34.9334                                                  | 38.4688                                                                     | 62   | 16.3955                                  | 11.9981                                                  | 11.4225                                                                     |
| 17   | 50.1089                                  | 34.1106                                                  | 38.0039                                                                     | 63   | 15.6837                                  | 11.6894                                                  | 11.1204                                                                     |
| 18   | 49.3563                                  | 33.3113                                                  | 37.6195                                                                     | 64   | 14.9839                                  | 11.3327                                                  | 10.8590                                                                     |
| 19   | 48.6241                                  | 32.5485                                                  | 37.2682                                                                     | 65   | 14.3041                                  | 10.9401                                                  | 10.6327                                                                     |
| 20   | 47.9063                                  | 31.8347                                                  | 36.9040                                                                     | 66   | 13.6508                                  | 10.5228                                                  | 10.4344                                                                     |
| 21   | 47.1974                                  | 31.1816                                                  | 36.4805                                                                     | 67   | 13.0293                                  | 10.0913                                                  | 10.2591                                                                     |
| 22   | 46.4923                                  | 30.6005                                                  | 35.9530                                                                     | 68   | 12.4392                                  | 9.6513                                                   | 10.0944                                                                     |
| 23   | 45.7866                                  | 30.0841                                                  | 35.3447                                                                     | 69   | 11.8796                                  | 9.2082                                                   | 9.9268                                                                      |
| 24   | 45.0768                                  | 29.6257                                                  | 34.6785                                                                     | 70   | 11.3498                                  | 8.7668                                                   | 9.7429                                                                      |
| 25   | 44.3595                                  | 29.2186                                                  | 33.9757                                                                     | 71   | 10.8489                                  | 8.3252                                                   | 9.5287                                                                      |
| 26   | 43.6308                                  | 28.8570                                                  | 33.2580                                                                     | 72   | 10.3763                                  | 7.8984                                                   | 9.2704                                                                      |
| 27   | 42.8876                                  | 28.5353                                                  | 32.5447                                                                     | 73   | 9.9239                                   | 7.4811                                                   | 8.9762                                                                      |
| 28   | 42.1326                                  | 28.2300                                                  | 31.8436                                                                     | 74   | 9.4844                                   | 7.0728                                                   | 8.6547                                                                      |
| 29   | 41.3682                                  | 27.9180                                                  | 31.1625                                                                     | 75   | 9.0505                                   | 6.6729                                                   | 8.3143                                                                      |
| 30   | 40.5972                                  | 27.5761                                                  | 30.5082                                                                     | 76   | 8.6152                                   | 6.3805                                                   | 7.9630                                                                      |
| 31   | 39.8221                                  | 27.1815                                                  | 29.8874                                                                     | 77   | 8.1720                                   | 5.8940                                                   | 7.6107                                                                      |
| 32   | 39.0449                                  | 26.7122                                                  | 29.3066                                                                     | 78   | 7.7372                                   | 5.5175                                                   | 7.2572                                                                      |
| 33   | 38.2658                                  | 26.1825                                                  | 28.7474                                                                     | 79   | 7.3254                                   | 5.1552                                                   | 6.9268                                                                      |
| 34   | 37.4848                                  | 25.6065                                                  | 28.1916                                                                     | 80   | 6.9510                                   | 4.8090                                                   | 6.5043                                                                      |
| 35   | 36.7014                                  | 24.9977                                                  | 27.6222                                                                     | 81   | 6.6274                                   | 4.4816                                                   | 6.1823                                                                      |
| 36   | 35.9159                                  | 24.3689                                                  | 27.0224                                                                     | 82   | 6.3690                                   | 4.1749                                                   | 5.8817                                                                      |
| 37   | 35.1278                                  | 23.7326                                                  | 26.3772                                                                     | 83   | 6.1485                                   | 3.8872                                                   | 5.5915                                                                      |
| 38   | 34.3394                                  | 23.0968                                                  | 25.7004                                                                     | 84   | 5.9381                                   | 3.6182                                                   | 5.3005                                                                      |
| 39   | 33.5527                                  | 22.4692                                                  | 25.0052                                                                     | 85   | 5.7094                                   | 3.3677                                                   | 4.9977                                                                      |
| 40   | 32.7693                                  | 21.8573                                                  | 24.3046                                                                     | 86   | 5.4321                                   | 2.1327                                                   | 4.6702                                                                      |
| 41   | 31.9909                                  | 21.2677                                                  | 23.6096                                                                     | 87   | 5.0775                                   | 2.9133                                                   | 4.3045                                                                      |
| 42   | 31.2136                                  | 20.7065                                                  | 22.9313                                                                     | 88   | 4.6692                                   | 2.7099                                                   | 3.9243                                                                      |
| 43   | 30.4465                                  | 20.1611                                                  | 22.2563                                                                     | 89   | 4.2364                                   | 2.5225                                                   | 3.5482                                                                      |
| 44   | 29.6814                                  | 19.6190                                                  | 21.5728                                                                     | 90   | 3.8025                                   | 2.3490                                                   | 3.1915                                                                      |
| 45   | 28.9164                                  | 19.0684                                                  | 20.8694                                                                     | 91   | 3.3766                                   | 2.1939                                                   | 2.8651                                                                      |
| 46   | 28.1496                                  | 18.4982                                                  | 20.1808                                                                     | 92   | 2.9789                                   | 2.0570                                                   | 2.5786                                                                      |
| 47   | 27.3793                                  | 17.8986                                                  | 19.3622                                                                     | 93   | 2.6054                                   | 1.9356                                                   | 2.3248                                                                      |
| 48   | 26.6083                                  | 17.2822                                                  | 18.5799                                                                     | 94   | 2.2510                                   | 1.8200                                                   | 2.0937                                                                      |
| 49   | 25.8392                                  | 16.6612                                                  | 17.8161                                                                     | 95   | 1.9194                                   | 1.7000                                                   | 1.8727                                                                      |
| 50   | 25.0745                                  | 16.0465                                                  | 17.0955                                                                     | 96   | 1.6133                                   | 1.5455                                                   | 1.6534                                                                      |
| 51   | 24.3158                                  | 15.4482                                                  | 16.4400                                                                     | 97   | 1.3291                                   | 1.3400                                                   | 1.4101                                                                      |
| 52   | 23.5657                                  | 14.8755                                                  | 15.8700                                                                     | 98   | 1.0652                                   | 1.1153                                                   | 1.1538                                                                      |
| 53   | 22.8241                                  | 14.3426                                                  | 15.3622                                                                     | 99   | .8390                                    | .8333                                                    | .8878                                                                       |
| 54   | 22.0904                                  | 13.8631                                                  | 14.8944                                                                     | 100  | .5000                                    | .5000                                                    | .5000                                                                       |
| 55   | 21.3650                                  | 13.4205                                                  | 14.4464                                                                     |      |                                          |                                                          |                                                                             |



TABLE J.—(continued.)

## EXPECTATION OF LIFE.

| Age. | No. 4.<br>Bakers.<br>Rural Districts,<br>Towns and Cities. | No. 5.<br>Miners.<br>Rural Districts,<br>Towns & Cities. | No. 6.<br>Rural Districts,<br>after<br>Abstracting<br>Labourers. | Age. | No. 4.<br>Bakers.<br>Rural Districts,<br>Towns & Cities. | No. 5.<br>Miners.<br>Rural Districts,<br>Towns & Cities. | No. 6.<br>Rural Districts,<br>after<br>Abstracting<br>Labourers. |
|------|------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------|------|----------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------|
| 10   | 47.9816                                                    | 48.5160                                                  | 50.7552                                                          | 56   | 16.2677                                                  | 13.7412                                                  | 18.6229                                                          |
| 11   | 47.1704                                                    | 47.7069                                                  | 49.8711                                                          | 57   | 15.7171                                                  | 13.2077                                                  | 17.9726                                                          |
| 12   | 46.3562                                                    | 46.8949                                                  | 48.9847                                                          | 58   | 15.1686                                                  | 12.7149                                                  | 17.3289                                                          |
| 13   | 45.5423                                                    | 46.0832                                                  | 48.1190                                                          | 59   | 14.6187                                                  | 12.2644                                                  | 16.6938                                                          |
| 14   | 44.7323                                                    | 45.2750                                                  | 47.2957                                                          | 60   | 14.0632                                                  | 11.8590                                                  | 16.0696                                                          |
| 15   | 43.9287                                                    | 44.4738                                                  | 46.5349                                                          | 61   | 13.4982                                                  | 11.5012                                                  | 15.4578                                                          |
| 16   | 43.1353                                                    | 43.6831                                                  | 45.8567                                                          | 62   | 12.9205                                                  | 11.1943                                                  | 14.8599                                                          |
| 17   | 42.3547                                                    | 42.9052                                                  | 45.2802                                                          | 63   | 12.3405                                                  | 10.9205                                                  | 14.2781                                                          |
| 18   | 41.5807                                                    | 42.1417                                                  | 44.7722                                                          | 64   | 11.7673                                                  | 10.6619                                                  | 13.7141                                                          |
| 19   | 40.8068                                                    | 41.3967                                                  | 44.2980                                                          | 65   | 11.2086                                                  | 10.4012                                                  | 13.1690                                                          |
| 20   | 40.0268                                                    | 40.6700                                                  | 43.8255                                                          | 66   | 10.6718                                                  | 10.1208                                                  | 12.6453                                                          |
| 21   | 39.2355                                                    | 39.9630                                                  | 43.3227                                                          | 67   | 10.1629                                                  | 9.8028                                                   | 12.1415                                                          |
| 22   | 38.4274                                                    | 39.2781                                                  | 42.7588                                                          | 68   | 9.6779                                                   | 9.4554                                                   | 11.6585                                                          |
| 23   | 37.6134                                                    | 38.5999                                                  | 42.1456                                                          | 69   | 9.2130                                                   | 9.0855                                                   | 11.1961                                                          |
| 24   | 36.8031                                                    | 37.9134                                                  | 41.4957                                                          | 70   | 8.7647                                                   | 8.7000                                                   | 10.7536                                                          |
| 25   | 36.0057                                                    | 37.2047                                                  | 40.8215                                                          | 71   | 8.3292                                                   | 8.3043                                                   | 10.3310                                                          |
| 26   | 35.2305                                                    | 36.4607                                                  | 40.1341                                                          | 72   | 7.9028                                                   | 7.9048                                                   | 9.9274                                                           |
| 27   | 34.4857                                                    | 35.6692                                                  | 39.4457                                                          | 73   | 7.4856                                                   | 7.5043                                                   | 9.5405                                                           |
| 28   | 33.8398                                                    | 34.8451                                                  | 38.7541                                                          | 74   | 7.0775                                                   | 7.1057                                                   | 9.1679                                                           |
| 29   | 33.0556                                                    | 34.0032                                                  | 38.0580                                                          | 75   | 6.6637                                                   | 6.6730                                                   | 8.8070                                                           |
| 30   | 32.3572                                                    | 33.1573                                                  | 37.3557                                                          | 76   | 6.2872                                                   | 6.2805                                                   | 8.4554                                                           |
| 31   | 31.6605                                                    | 32.3201                                                  | 36.6463                                                          | 77   | 5.8995                                                   | 5.8937                                                   | 8.1108                                                           |
| 32   | 30.9597                                                    | 31.5034                                                  | 35.9283                                                          | 78   | 5.5238                                                   | 5.5174                                                   | 7.7750                                                           |
| 33   | 30.2455                                                    | 30.6987                                                  | 35.2035                                                          | 79   | 5.1618                                                   | 5.1545                                                   | 7.4499                                                           |
| 34   | 29.5094                                                    | 29.8978                                                  | 34.4739                                                          | 80   | 4.8168                                                   | 4.8085                                                   | 7.1374                                                           |
| 35   | 28.7434                                                    | 29.0930                                                  | 33.7408                                                          | 81   | 4.4904                                                   | 4.4815                                                   | 6.8539                                                           |
| 36   | 27.9398                                                    | 28.2770                                                  | 33.0059                                                          | 82   | 4.1749                                                   | 4.1743                                                   | 6.5552                                                           |
| 37   | 27.0927                                                    | 27.4435                                                  | 32.2706                                                          | 83   | 3.8877                                                   | 3.8868                                                   | 6.2784                                                           |
| 38   | 26.2210                                                    | 26.6009                                                  | 31.5333                                                          | 84   | 3.6195                                                   | 3.6185                                                   | 5.9964                                                           |
| 39   | 25.3429                                                    | 25.7574                                                  | 30.7933                                                          | 85   | 3.3687                                                   | 3.3675                                                   | 5.6913                                                           |
| 40   | 24.4756                                                    | 24.9204                                                  | 30.0496                                                          | 86   | 3.1343                                                   | 3.1329                                                   | 5.3516                                                           |
| 41   | 23.6309                                                    | 24.0960                                                  | 29.3010                                                          | 87   | 2.9159                                                   | 2.9134                                                   | 4.9740                                                           |
| 42   | 22.8249                                                    | 23.2900                                                  | 28.5463                                                          | 88   | 2.7123                                                   | 2.7092                                                   | 4.5651                                                           |
| 43   | 22.0738                                                    | 22.5042                                                  | 27.7893                                                          | 89   | 2.5249                                                   | 2.5209                                                   | 4.1389                                                           |
| 44   | 21.3936                                                    | 21.7382                                                  | 27.0333                                                          | 90   | 2.3531                                                   | 2.3492                                                   | 3.7130                                                           |
| 45   | 20.7992                                                    | 20.9930                                                  | 26.2812                                                          | 91   | 2.1991                                                   | 2.1920                                                   | 3.2998                                                           |
| 46   | 20.3060                                                    | 20.2680                                                  | 25.5357                                                          | 92   | 2.0655                                                   | 2.0574                                                   | 2.8994                                                           |
| 47   | 19.9306                                                    | 19.5639                                                  | 24.7993                                                          | 93   | 1.9494                                                   | 1.9379                                                   | 2.5320                                                           |
| 48   | 19.6301                                                    | 18.8763                                                  | 24.0729                                                          | 94   | 1.8455                                                   | 1.8280                                                   | 2.1839                                                           |
| 49   | 19.3638                                                    | 18.2011                                                  | 23.3568                                                          | 95   | 1.7256                                                   | 1.7018                                                   | 1.8603                                                           |
| 50   | 19.0910                                                    | 17.5346                                                  | 22.6512                                                          | 96   | 1.5897                                                   | 1.5448                                                   | 1.5618                                                           |
| 51   | 18.7710                                                    | 16.8730                                                  | 21.9568                                                          | 97   | 1.3888                                                   | 1.3421                                                   | 1.2965                                                           |
| 52   | 18.3646                                                    | 16.2135                                                  | 21.2738                                                          | 98   | 1.1666                                                   | 1.1000                                                   | 1.0487                                                           |
| 53   | 17.8918                                                    | 15.5645                                                  | 20.6004                                                          | 99   | .8333                                                    | .8333                                                    | .8401                                                            |
| 54   | 17.3722                                                    | 14.9176                                                  | 19.9351                                                          | 100  | .5000                                                    | .5000                                                    | .5000                                                            |
| 55   | 16.8251                                                    | 14.3131                                                  | 19.2764                                                          |      |                                                          |                                                          |                                                                  |



high ratio which the numbers of the class compared bear to the total number. For example :—

Let  $a = 20$  per cent. and represent the total results or general average; and  
 $\left. \begin{array}{l} \dots b = 25 \\ \dots c = 15 \end{array} \right\}$  per cent. and represent classes composing the general average  $a$ ;

then, if either class  $b$  or class  $c$  were compared with the total result or general average, the apparent difference would be only 5 per cent.; while the actual difference between it and the residue class is 10 per cent. Hence, if any class of results be compared with the general results in which that is also included, the apparent difference will always be less than the actual difference, whether the effect of that class be to increase or decrease the ratio of the general results.

The facts forming Table I, No. 1, have therefore been eliminated from the general results for the Rural Districts in Table E, and the residue formed into another Life Table, from which Table I, No. 6, has been deduced; and it will be found that the specific intensity for the Rural Districts generally is as high

at Age 20 in Table F Rural Districts as at Age 16 for the Residue.

|    |     |     |    |     |
|----|-----|-----|----|-----|
| 30 | ... | ... | 16 | ... |
| 40 | ... | ... | 35 | ... |
| 50 | ... | ... | 48 | ... |
| 60 | ... | ... | 58 | ... |
| 70 | ... | ... | 69 | ... |

The corresponding points of equal specific intensity for the Residue at

Age 20 in Table I, No. 6, is as high as Age 52 for Labourers in Table I, No. 1;

|    |     |     |    |
|----|-----|-----|----|
| 30 | ... | ... | 44 |
| 40 | ... | ... | 48 |
| 50 | ... | ... | 55 |
| 60 | ... | ... | 65 |
| 70 | ... | ... | 72 |

Half the population dies off at Age 65–66 in the Residue, at Age 68–9 in the General Average, and at Age 71–2 in the Labourers.

The great distinction between the value of life among the labouring population in the Rural Districts, and the rest of the Rural Districts, is therefore obvious; and conclusively shews, that even in the same locality, in the Rural Districts of the country, where all the supposed contaminating influences of ill-ventilated houses, narrow streets, bad sewerage, poisoned air, epidemic town fevers, and factory restraints, are absent, there is nevertheless a very great superiority in the value of life in one class over another. In the



Rural Districts recited in the early part of this Paper, very little difference can be supposed to exist between the means of support and the various habits of life of the members of Friendly Societies. In fact, they may be presumed to assimilate as near to each other's condition as any means of classification can suggest, the only difference between the individual members being difference of employment or occupation; and therefore, in classifying the various trades, pure elements may be said to be brought into comparison, the only distinction being difference of occupation.

It has already been stated that any thing like a complete inquiry into the influence of employment on health is not contemplated in this Paper. A few illustrations only will be brought forward to aid the other branch of the inquiry, and by which it will be seen that, independently of locality, difference of employment has a marked effect on the duration of life.

If this position can be fairly established, it will follow as a direct consequence, that wherever an excess of unhealthy trades are congregated, there must also be an increased rate of mortality independent of the local influence; for if the same trades were placed in any other district, there would still be an increased rate of mortality simply in virtue of the trade or occupation.

At Ages 30-35, the general mortality of the Town Districts exceeds that of the Rural by 14.981 per cent. of the whole mortality at that period of life; but if the class designated Labourers were abstracted from the Rural District, the mortality of the residue would be increased 6.181 per cent. of the original ratio. But suppose a still further change to take place, and that the class named Labourers is not only abstracted from the Rural Districts, but added to the Town Districts; this arrangement would affect the respective mortalities to such an extent, that instead of the mortality of the Town Districts exceeding that of the Rural Districts by 14.981 per cent., it would fall short of it by 1.831 per cent. of the whole mortality at that period of life. In like manner also would other periods of life be affected. It is evident, therefore, that the Residue of the population in the Rural Districts has a factitious value assigned to it, from being mixed up with the class called Labourers; and that in any attempt to discover the relative values of life in different localities, unless employment were made an element in the comparison, an undue value would be attached to a great portion of life in the Rural Districts. The nature of the Rural Districts is such, that a great proportion of the upgrown population must consist of Agricultural and other Labourers. In the facts here collected, they amount to 33 per cent.; and their lives being of higher value than the average lives in the district, it is no more fair to judge of the value of life and the influence of locality on the residue of the population from calculations involving the consideration of all the lives generally, than it would be just to compare the value of life in the Residue in the preceding illustration with Town



draw the conclusion that life in the Rural Districts was of less value than in the Districts; for in both cases a fictitious value is assigned, by being mixed up with a variable class.

From the preceding remarks it is evident that in particular occupations, even in the Rural Districts, life is of less value than in others. Those occupations cannot be said to be less healthy from the objectionable features peculiar to large Towns and Cities, for they must be supposed under very favourable circumstances for prolonged life. In Table H, No. 4, is given the expectation of life in sixteen trades in the Rural District, selected at random, without any previous knowledge as to whether they were healthy or otherwise. An inspection of this Table will shew, that in those sixteen trades, (namely, Plumbers Painters and Glaziers, Weavers, Butchers, Millwrights, Stonemasons, Cabinet-makers, Printers, Bakers, Bricklayers, Wheelwrights, Tailors, Cordwainers and Shoemakers, Sawyers, Clerks, Carpenters and Joiners, and Blacksmiths,) the value of life is less than the average for the whole Rural Districts; and Labourers were before shewn to be more healthy than the average results. It is therefore clear, that if a given District were chiefly made up of the class whose lives are above the average value, or of those below it, that the general results for that District would be of high or low value accordingly.

A very small portion of the population in either the Town or City Districts can follow agricultural pursuits; and therefore the standard of life in those Districts will be lowered in consequence of that circumstance alone; but on further examination it will be found that the comparative value of life in those Districts is not only lowered in consequence of the absence of many of the most healthy occupations common to the Rural Districts, but that it is still further decreased by the presence of some of the most unhealthy employments, not to be found, or at least to a very limited extent, in the Rural Districts. In other words, the effect of the occupations is such, that if the same people were placed in the Rural Districts, no matter over how much surface they were spread, in order to avoid the influence supposed to connect itself with the congregation of large numbers into towns, still the mortality would be much higher among the people thus conditioned, than among the average of the rural population in ordinary circumstances.

If the view brought forward be correct, that the mortality of Towns and Cities is increased from the existence of a high proportion of trades which are in themselves unhealthy, independent of the influence of the locality, it should follow that the difference found by a comparison of the rate of mortality of a given number of trades in one district, with that of the same trades in another district, should be less than the difference between the rates of mortality for the general results of the same districts. If the differences of the decennial periods from 10 to 70 in the general results for Rural and Town Districts be taken, the sum of the differences will be found to amount to 19.3299 years; but the sum of the differences at the corresponding periods for the 16 Trades formerly referred to is



only 16·3868 years; being less than the other by about 15 per cent. For a like reason it should follow, that if the differences at the same periods between the 16 Trades, and the general results of each district be taken, they should amount to less in the Town than in the Rural Districts; and accordingly in the Rural Districts the sum of the differences is found to be 4·7029 years, while in the Town Districts it is only 1·7598 years.

In order to afford still further evidence of the effect on the average value of life by the prevalence of particular trades, a few other cases will be submitted; and to render the illustrations more simple they will be given for the average of the Three Districts, or rather with the Three Districts conjoined; and consequently they must be brought into comparison with the General Results for the Three Districts as given in Tables F and C.

An inspection of Table I will shew that the equation of life in Miners is at Ages 61-2; in Bakers, at Ages 59-60; Plumbers Painters and Glaziers, at 56-7; and Clerks, at so early a period of life as 51-2. In F, for the Three Districts combined, the same results appeared at Ages 66-7, shewing a difference of 5, 7, 10, and 15 years respectively; and the following Abridgement of Table J will shew the marked difference in the expectation of life in these employments at five decennial periods.

| Age. | Rural, Town,<br>and<br>City Districts.<br>G. | Clerks.<br>J, No. 2. | Plumbers,<br>Painters, and<br>Glaziers.<br>J, No. 3. | Bakers.<br>J, No. 4. | Miners.<br>J, No. 5. |
|------|----------------------------------------------|----------------------|------------------------------------------------------|----------------------|----------------------|
| 20   | 43·7736                                      | 31·8347              | 36·9040                                              | 40·0268              | 40·6700              |
| 30   | 36·6051                                      | 27·5761              | 30·5082                                              | 32·3572              | 33·1573              |
| 40   | 29·3306                                      | 21·8573              | 24·3046                                              | 24·4756              | 24·9204              |
| 50   | 22·1920                                      | 16·0465              | 17·0955                                              | 19·0910              | 17·5346              |
| 60   | 15·6942                                      | 12·4264              | 12·1675                                              | 14·0632              | 11·8590              |

The very remarkable difference between the above employments and the General Results, cannot fail to occasion some surprise; and at the same time conclusively prove, that any district containing a majority of the above, or other equally unhealthy employments, must shew a very reduced average value of life for the district, independent of the influence of the local situation itself on health.

It will no doubt cause some uneasiness in the minds of inquirers to find, that so highly important and industrious a class of men as Clerks should stand lowest in the scale of the above employments; and that from 20 to 60 their expectation of life should be only 75 per cent. of the general average. A solution of this will hereafter appear. The expectation of life among Plumbers Painters and Glaziers in the same period is equal to 81 per cent., Miners 85 per cent., and Bakers 88 per cent. of the general average.

Plumbers Painters and Glaziers will be found next in the scale; and although much



below the general average, they are still of considerably higher value than the class designated Clerks.

Bakers, as well as the preceding class, have long been supposed to be unhealthy: and although no attempt had hitherto been made to ascertain the precise value of their lives, it is thought that the present results will shew a much greater difference than would be generally calculated upon. The class Miners will be found to rank above the three others at the early periods of life, but below them at the latter periods of life.

The remark formerly made should be here kept clearly in view, that the difference found by a comparison of any class with the general results will always be less than the actual difference; and therefore the effect which the preceding and other unhealthy employments have in reducing the average rate of mortality, is still greater than what appears by the preceding Table.

Some large towns or cities are known to represent a less value of life to their inhabitants generally than other towns; and the explanation usually given of this difference has been the favourable or unfavourable nature of the locality, and a change in the sanitary regulations of the place looked forward to as a certain remedy; but a minute examination of all the external circumstances affecting life will shew, that the great diversity in the mortality of certain classes arises from the influence of other agents. In Table H, No. 2, is given the expectation of life calculated from the combined data of all trades in Liverpool; and a comparison of this with the general results for the Rural Districts will shew a much greater difference due to locality in the apparent sense, than has hitherto been shewn by any other tables of the value of life in different localities; but at the same time it will be seen that this difference falls much short of the actual difference between different employments." At Age 30 the difference between the expectation of life in the Rural Districts and in Liverpool is 8·2636 years; but the difference between Clerks and Labourers is 13·0211 years; and so also at other periods of life. It ought to be understood, that in making this comparison, the influence of employment is shewn to disadvantage; for, as has been already pointed out, every large town has its average lowered by the influence of certain trades; and therefore the actual difference in the above comparison between the Rural Districts and Liverpool is less than there given: and again, in the comparison between Clerks and Labourers, the expectation for Clerks has been for the average of the three districts; but if it had been taken for the City Districts only, a much greater difference would have been found, and consequently the influence of employments appeared the greater.

From Table K, No. 2, it will appear that there is a uniform decrease in the specific intensity of life from the commencement to the end of the table. A comparison will shew that the specific intensities at ages 30, 40, and 50, correspond with the specific intensities at ages [45, 54,



TABLE K, No. 1.

RURAL, TOWN AND CITY DISTRICTS.—TRADES NOT CLASSIFIED.—*Females.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 1389   | 1.3888                 | 71.994                 | 56   | 62073   | 1061   | 1.7094                 | 58.514                 |
| 11   | 98611   | 1370   | 1.3888                 | 71.994                 | 57   | 61012   | 1039   | 1.7021                 | 58.754                 |
| 12   | 97241   | 1334   | 1.3715                 | 72.886                 | 58   | 59973   | 1020   | 1.7002                 | 58.824                 |
| 13   | 95907   | 1282   | 1.3368                 | 74.794                 | 59   | 58953   | 1004   | 1.7037                 | 58.685                 |
| 14   | 94625   | 1216   | 1.2848                 | 77.821                 | 60   | 57949   | 992    | 1.7126                 | 58.377                 |
| 15   | 93409   | 1135   | 1.2155                 | 82.237                 | 61   | 56957   | 984    | 1.7269                 | 57.904                 |
| 16   | 92274   | 1042   | 1.1288                 | 88.574                 | 62   | 55973   | 1024   | 1.8294                 | 54.675                 |
| 17   | 91232   | 951    | 1.0429                 | 95.877                 | 63   | 54949   | 1110   | 2.0202                 | 49.505                 |
| 18   | 90281   | 865    | .9579                  | 104.395                | 64   | 53839   | 1238   | 2.2991                 | 43.497                 |
| 19   | 89416   | 781    | .8736                  | 114.469                | 65   | 52601   | 1403   | 2.6663                 | 37.509                 |
| 20   | 88635   | 700    | .7902                  | 126.550                | 66   | 51198   | 1598   | 3.1216                 | 32.031                 |
| 21   | 87935   | 622    | .7076                  | 141.323                | 67   | 49600   | 1792   | 3.6120                 | 27.685                 |
| 22   | 87313   | 569    | .6521                  | 153.351                | 68   | 47808   | 1978   | 4.1375                 | 24.166                 |
| 23   | 86744   | 541    | .6237                  | 160.334                | 69   | 45830   | 2153   | 4.6980                 | 21.286                 |
| 24   | 86203   | 537    | .6224                  | 160.668                | 70   | 43677   | 2312   | 5.2936                 | 18.889                 |
| 25   | 85666   | 555    | .6482                  | 154.273                | 71   | 41365   | 2451   | 5.9242                 | 16.880                 |
| 26   | 85111   | 597    | .7010                  | 142.653                | 72   | 38914   | 2491   | 6.4013                 | 15.623                 |
| 27   | 84514   | 621    | .7349                  | 136.073                | 73   | 36423   | 2449   | 6.7247                 | 14.870                 |
| 28   | 83893   | 629    | .7499                  | 133.351                | 74   | 33974   | 2342   | 6.8945                 | 14.503                 |
| 29   | 83264   | 621    | .7462                  | 134.012                | 75   | 31632   | 2186   | 6.9106                 | 14.470                 |
| 30   | 82643   | 598    | .7237                  | 138.179                | 76   | 29446   | 1995   | 6.7731                 | 14.765                 |
| 31   | 82045   | 560    | .6825                  | 146.520                | 77   | 27451   | 1870   | 6.8123                 | 14.680                 |
| 32   | 81485   | 539    | .6618                  | 151.103                | 78   | 25581   | 1797   | 7.0282                 | 14.229                 |
| 33   | 80946   | 535    | .6615                  | 151.172                | 79   | 23784   | 1765   | 7.4207                 | 13.475                 |
| 34   | 80411   | 548    | .6816                  | 146.714                | 80   | 22019   | 1759   | 7.9899                 | 12.516                 |
| 35   | 79863   | 577    | .7221                  | 138.485                | 81   | 20260   | 1770   | 8.7357                 | 11.447                 |
| 36   | 79286   | 621    | .7830                  | 127.714                | 82   | 18490   | 1751   | 9.4684                 | 10.562                 |
| 37   | 78665   | 658    | .8367                  | 119.517                | 83   | 16739   | 1705   | 10.1880                | 9.814                  |
| 38   | 78007   | 689    | .8833                  | 113.212                | 84   | 15034   | 1637   | 10.8946                | 9.183                  |
| 39   | 77318   | 713    | .9227                  | 108.378                | 85   | 13397   | 1553   | 11.5880                | 8.628                  |
| 40   | 76605   | 732    | .9550                  | 104.712                | 86   | 11844   | 1453   | 12.2683                | 8.150                  |
| 41   | 75873   | 744    | .9800                  | 102.041                | 87   | 10391   | 1335   | 12.8507                | 7.782                  |
| 42   | 75129   | 758    | 1.0085                 | 99.108                 | 88   | 9056    | 1316   | 14.5351                | 6.878                  |
| 43   | 74371   | 774    | 1.0402                 | 96.154                 | 89   | 7740    | 1294   | 16.7216                | 5.981                  |
| 44   | 73597   | 791    | 1.0754                 | 93.023                 | 90   | 6446    | 1251   | 19.4102                | 5.152                  |
| 45   | 72806   | 811    | 1.1139                 | 89.767                 | 91   | 5195    | 1174   | 22.6008                | 4.425                  |
| 46   | 71995   | 832    | 1.1557                 | 86.505                 | 92   | 4021    | 1069   | 26.5925                | 3.759                  |
| 47   | 71163   | 861    | 1.2095                 | 82.645                 | 93   | 2952    | 881    | 29.8333                | 3.352                  |
| 48   | 70302   | 897    | 1.2753                 | 78.431                 | 94   | 2071    | 684    | 33.0399                | 3.027                  |
| 49   | 69405   | 939    | 1.3531                 | 73.910                 | 95   | 1387    | 504    | 36.3589                | 2.750                  |
| 50   | 68466   | 988    | 1.4428                 | 69.300                 | 96   | 883     | 350    | 39.6498                | 2.522                  |
| 51   | 67478   | 1042   | 1.5444                 | 64.767                 | 97   | 533     | 241    | 45.1555                | 2.214                  |
| 52   | 66436   | 1078   | 1.6232                 | 61.614                 | 98   | 292     | 155    | 52.9127                | 1.890                  |
| 53   | 65358   | 1097   | 1.6791                 | 59.559                 | 99   | 137     | 84     | 61.3067                | 1.631                  |
| 54   | 64261   | 1100   | 1.7121                 | 58.411                 | 100  | 53      | 53     | 75.0000                | 1.333                  |
| 55   | 63161   | 1088   | 1.7222                 | 58.072                 |      |         |        |                        |                        |



## DURATION OF LIFE

TABLE K, No. 2.

TRADES NOT CLASSIFIED.—LIVERPOOL.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 396    | ·3961                  | 252·462                | 56   | 53834   | 1751   | 3·2529                 | 30·741                 |
| 11   | 99604   | 395    | ·3961                  | 252·462                | 57   | 52083   | 1741   | 3·3422                 | 29·922                 |
| 12   | 99209   | 401    | ·4038                  | 247·647                | 58   | 50342   | 1810   | 3·5961                 | 27·809                 |
| 13   | 98808   | 414    | ·4193                  | 238·493                | 59   | 48532   | 1949   | 4·0148                 | 24·907                 |
| 14   | 98394   | 435    | ·4425                  | 225·989                | 60   | 46583   | 2142   | 4·5981                 | 21·749                 |
| 15   | 97959   | 464    | ·4735                  | 211·193                | 61   | 44441   | 2376   | 5·3461                 | 18·706                 |
| 16   | 97495   | 499    | ·5123                  | 195·198                | 62   | 42065   | 2501   | 5·9445                 | 16·821                 |
| 17   | 96996   | 522    | ·5379                  | 185·908                | 63   | 39564   | 2529   | 6·3933                 | 15·642                 |
| 18   | 96474   | 531    | ·5506                  | 181·620                | 64   | 37035   | 2479   | 6·6925                 | 14·943                 |
| 19   | 95943   | 528    | ·5501                  | 181·785                | 65   | 34556   | 2364   | 6·8421                 | 14·616                 |
| 20   | 95415   | 512    | ·5367                  | 186·324                | 66   | 32192   | 2203   | 6·8421                 | 14·616                 |
| 21   | 94903   | 484    | ·5101                  | 196·040                | 67   | 29989   | 2062   | 6·8761                 | 14·543                 |
| 22   | 94419   | 478    | ·5061                  | 197·589                | 68   | 27927   | 1939   | 6·9441                 | 14·401                 |
| 23   | 93941   | 493    | ·5247                  | 190·585                | 69   | 25988   | 1831   | 7·0461                 | 14·192                 |
| 24   | 93448   | 529    | ·5657                  | 176·772                | 70   | 24157   | 1735   | 7·1821                 | 13·924                 |
| 25   | 92919   | 585    | ·6294                  | 158·881                | 71   | 22422   | 1649   | 7·3522                 | 13·602                 |
| 26   | 92334   | 661    | ·7155                  | 139·762                | 72   | 20773   | 1582   | 7·6148                 | 13·132                 |
| 27   | 91673   | 722    | ·7872                  | 127·033                | 73   | 19191   | 1530   | 7·9700                 | 12·547                 |
| 28   | 90951   | 768    | ·8443                  | 118·441                | 74   | 17661   | 1487   | 8·4178                 | 11·879                 |
| 29   | 90183   | 800    | ·8870                  | 112·740                | 75   | 16174   | 1449   | 8·9582                 | 11·632                 |
| 30   | 89383   | 818    | ·9151                  | 109·278                | 76   | 14725   | 1412   | 9·5911                 | 10·426                 |
| 31   | 88565   | 823    | ·9288                  | 107·666                | 77   | 13313   | 1380   | 10·3620                | 9·653                  |
| 32   | 87742   | 840    | ·9576                  | 104·428                | 78   | 11933   | 1345   | 11·2708                | 8·873                  |
| 33   | 86902   | 871    | 1·0017                 | 99·800                 | 79   | 10588   | 1304   | 12·3175                | 8·117                  |
| 34   | 86031   | 913    | 1·0611                 | 94·251                 | 80   | 9284    | 1254   | 13·5021                | 7·407                  |
| 35   | 85118   | 967    | 1·1356                 | 88·028                 | 81   | 8030    | 1190   | 14·8247                | 6·748                  |
| 36   | 84151   | 1031   | 1·2254                 | 81·633                 | 82   | 6840    | 1111   | 16·2427                | 6·158                  |
| 37   | 83120   | 1090   | 1·3108                 | 76·278                 | 83   | 5729    | 1017   | 17·7563                | 5·631                  |
| 38   | 82032   | 1142   | 1·3918                 | 71·839                 | 84   | 4712    | 913    | 19·3654                | 5·163                  |
| 39   | 80888   | 1188   | 1·4685                 | 68·074                 | 85   | 3799    | 800    | 21·0700                | 4·746                  |
| 40   | 79700   | 1228   | 1·5407                 | 64·893                 | 86   | 2999    | 686    | 22·8702                | 4·373                  |
| 41   | 78472   | 1262   | 1·6086                 | 62·150                 | 87   | 2313    | 574    | 24·7975                | 4·032                  |
| 42   | 77210   | 1302   | 1·6863                 | 59·312                 | 88   | 1739    | 467    | 26·8519                | 3·724                  |
| 43   | 75908   | 1346   | 1·7737                 | 56·370                 | 89   | 1272    | 378    | 29·0335                | 3·445                  |
| 44   | 74562   | 1395   | 1·8709                 | 53·447                 | 90   | 894     | 280    | 31·3423                | 3·191                  |
| 45   | 73167   | 1447   | 1·9778                 | 50·556                 | 91   | 614     | 207    | 33·7782                | 2·960                  |
| 46   | 71720   | 1502   | 2·0945                 | 47·733                 | 92   | 407     | 147    | 36·0224                | 2·776                  |
| 47   | 70218   | 1569   | 2·2339                 | 44·763                 | 93   | 260     | 99     | 38·0748                | 2·627                  |
| 48   | 68649   | 1645   | 2·3960                 | 41·736                 | 94   | 161     | 64     | 39·9356                | 2·504                  |
| 49   | 67004   | 1729   | 2·5808                 | 38·745                 | 95   | 97      | 40     | 41·6047                | 2·404                  |
| 50   | 65275   | 1820   | 2·7883                 | 35·868                 | 96   | 57      | 25     | 43·0820                | 2·321                  |
| 51   | 63455   | 1915   | 3·0185                 | 33·124                 | 97   | 32      | 15     | 47·3179                | 2·113                  |
| 52   | 61540   | 1962   | 3·1876                 | 31·368                 | 98   | 17      | 9      | 53·9970                | 1·852                  |
| 53   | 59578   | 1964   | 3·2956                 | 30·340                 | 99   | 8       | 5      | 61·3067                | 1·631                  |
| 54   | 57614   | 1926   | 3·3425                 | 29·913                 | 100  | 3       | 3      | 75·0000                | 1·333                  |
| 55   | 55688   | 1854   | 3·3282                 | 30·048                 |      |         |        |                        |                        |



45, 54, and 63 in the Rural Districts; Ages 38, 49, and 57 in the Towns; Ages 29, 42, and 59 in the Cities; and at Ages 39, 51, and 61 in the Three Districts combined. A further inspection of the same table will shew that half the population dies off between the ages 58-9,—an earlier period than in the City Districts of Table F by 3 years.

In Table H, No. 2, the expectation of life for all trades in Liverpool will be found to be lower than the expectation given in Table G for the City Districts generally. The following shews the difference at decennial periods of Life.

| Age. | City Districts.<br>Table G. | Liverpool. | Difference. |
|------|-----------------------------|------------|-------------|
| 20   | 40·0148                     | 37·9553    | 2·0595      |
| 30   | 32·8603                     | 30·1437    | 2·7166      |
| 40   | 26·0873                     | 23·1524    | 2·9349      |
| 50   | 19·9271                     | 17·0946    | 2·8325      |
| 60   | 13·7685                     | 11·9626    | 1·8059      |

So far as a general inspection of the above results would suffice, it might be inferred that Liverpool is less healthy than the average of the large cities in England; but it is necessary here again to keep in view the peculiar aggregation of employments which are in themselves unhealthy, independent of the locality; for it so happens, that the class of Labourers in large cities is subject to a very high rate of mortality, and that the peculiar business of Liverpool occasions a great preponderance of that class in the dock, and other employments of that kind, a large proportion of which enters into the above results.

It has been shewn in Table F, for the Three Districts, that the expectation of life for Members of Friendly Societies over the country generally, is higher than that for the whole population of England and Wales as given in Table D. In like manner it will also be found, that the expectation of life among the Members of Friendly Societies in Liverpool is also higher than the expectation for the general population of Liverpool.

At page XXVII. of the 5th Report of the Registrar General will be found a table of the Expectation of Life for the Town of Liverpool; and assuming that it gives a correct representation of the value of life of the whole population, we shall find the comparative value of life between the Members of Friendly Societies and the general population in the following Table:—

| Age. | Expectation of Life in<br>Liverpool. |                   | Difference in favour of<br>Friendly Societies in Liverpool. |           |
|------|--------------------------------------|-------------------|-------------------------------------------------------------|-----------|
|      | Friendly Societies.                  | Whole Population. | In Years.                                                   | Per Cent. |
| 20   | 37·9553                              | 33·0000           | 4·9553                                                      | 15·0160   |
| 25   | 33·9067                              | 30·0000           | 3·9067                                                      | 13·0223   |
| 30   | 30·1437                              | 27·0000           | 3·1437                                                      | 11·6433   |
| 35   | 26·5260                              | 23·0000           | 3·5260                                                      | 15·3303   |
| 40   | 23·1524                              | 21·0000           | 2·1524                                                      | 10·2500   |
| 45   | 19·9908                              | 18·0000           | 1·9908                                                      | 11·0600   |
| 50   | 17·0946                              | 16·0000           | 1·0946                                                      | 5·6922    |



A careful consideration of all the preceding observations, it is believed, will be sufficient to shew that the excessive mortality of the general population of Liverpool must be due to some other cause than simply that of locality. The persons over whom the observations in the first column extend, being members of Friendly Societies, and almost exclusively workmen and mechanics, of necessity inhabit the inferior class of houses, in the worst conditioned streets; and it is therefore impossible that they can escape the contagious effect of the pestilential diseases supposed to be the scourge of unhealthy neighbourhoods: and admitting this, the results given for the Friendly Societies must evidence all the legitimate effects due to locality; and therefore the excessive mortality of the general population is due to some other cause—such as the poverty and distress which, unhappily, are allowed to remain so much neglected in the large manufacturing and commercial towns of the kingdom. If any part of this argument were to be met by the statement, that the higher expectation of life given for the members of Friendly Societies in Liverpool than for the general community, may be accounted for by the omission of some very unhealthy trades; this would be sufficiently answered by the fact, that 175 employments are included, and, as has already been shewn, some of them the most unhealthy occupations; so that a fair average may be said to be taken. A similar objection might also seem to apply against the general results for the whole kingdom; but if it is recollected that upwards of four hundred trades are included, the force of the objection will disappear.

It is evident from all that has been said, that the peculiar sanitary condition of large towns has not the remarkable effect which many have supposed in shortening the duration of life; still, it has some effect, and the nature and extent of that influence it is important to understand. But a rude estimate only can be made, until the value of life in every important employment, occupation, or trade has been investigated, for the various localities or districts, on some such plan as that given in the present paper; and then grouping or classifying a given number of these common to different localities: the result arrived at would shew the precise amount of influence which a particular District, City, or Town, has on the duration of life. A partial or limited comparison of a few trades would not be adequate to answer definitely this question, but an accurate combination of a sufficiently large number of trades, to guard against the effect of fluctuation.

In the beginning of this Paper it was stated, that to carry out the question in this extended degree was a task of too imposing a nature on the present occasion; and that such illustrations would only be brought forward, as would be necessary to solve the more immediate question.

On the general mortality of large towns especially, little confidence should be placed, even although every other precaution as to distinction of age and other conditions be taken; for fallacies from two sources are apt to enter:—First, if, in comparisons of large towns,



precisely the same classes of trades do not exist, errors will arise from that circumstance ;— and in the second place, although the same classes of trades do exist in both places, unless the proportionate numbers to the whole population be the same, errors in the result must arise. The nature of the error in the first case is plain, from the fact that different trades are in the same place influenced by different rates of mortality ; and if any given trade is wanting, its tendency to alter the general average will be lost. The error in the second case is of a like nature ; for if the absence of the whole class affect the general result, the absence of a fraction of that class must also affect it, although not to the same extent. Illustrations confirmatory of this have already been given when discussing the influence of the class of Labourers, and also the Sixteen Trades combined, on the general averages for the respective Districts ; and a recurrence to those illustrations will be sufficient to shew the truth of the present observations.

An inspection of TABLE K, No. 1, will shew the Rate of Mortality for Female Life among the Members of Friendly Societies in England and Wales, for the Rural, Town, and City Districts combined. The Tables for Male and Female Life here given, seem to possess in many respects the same relation as those given for Male and Female Life generally in England and Wales ; the Specific Intensity at the earlier periods being higher for Male than Female Life, crossing each other at the middle periods, and turning in favour of Female Life at the advanced ages. It will be seen that the Male Population of Table F for the Three Districts is bisected at 66–7, and that the Female Population in Table K, No. 1, is also bisected at the same period of life. In the general population of the country the same thing takes place a year later among Females than among Males.

The Expectation for Female Life, for the general results of Friendly Societies, will be found in Table H, No. 1 ; and the following Abstract will shew the relative value of Male and Female Life in the country generally, as well as in Friendly Societies :—

| Age. | Expectation of Life in England and Wales. |          |             | Expectation of Life among<br>the Members of Friendly Societies. |          |             |
|------|-------------------------------------------|----------|-------------|-----------------------------------------------------------------|----------|-------------|
|      | Males.                                    | Females. | Difference. | Males.                                                          | Females. | Difference. |
| 20   | 40·6910                                   | 41·5982  | ·9072       | 43·7736                                                         | 45·2640  | 1·4904      |
| 30   | 34·0990                                   | 35·1671  | 1·0681      | 36·6051                                                         | 38·1841  | 1·5790      |
| 40   | 27·4760                                   | 28·7330  | 1·2570      | 29·3306                                                         | 30·7813  | 1·4507      |
| 50   | 20·8463                                   | 22·0545  | 1·2082      | 22·1920                                                         | 23·8200  | 1·6280      |
| 60   | 14·5854                                   | 15·5230  | ·9396       | 15·6942                                                         | 17·2380  | 1·5438      |
| 70   | 9·2176                                    | 9·8409   | ·9376       | 10·2057                                                         | 10·9750  | ·7693       |

It will thus be seen, that the distinction between Male and Female Life among the Members of Friendly Societies, differs very little from that between the sexes in the country generally ; and this difference would be considerably reduced if the necessary corrections for employments were made, as the data for Male Life in Friendly Societies



will be composed of a much higher proportion of unhealthy trades, in relation to the whole male population of the country, than the data for Female Life in comparison to the whole female population. This coincidence of course tends to strengthen the confidence to be reposed in both classes of results, and brings forward an additional argument against the sufficiency of certain inquiries hitherto made, shewing in some instances so wide a distinction between the value of life in the sexes.

In a subsequent portion of the present edition of these contributions a large amount of additional data will be found introduced, bearing directly on particular classes of society, and supporting in a very decided and conclusive manner the views developed by the preceding facts as given in the first and second editions. It is, however, thought better not to interfere with the original course of argument by introducing the new matter at this place, and it is consequently reserved for a more advanced part of this paper.

| Age | Male   | Female | Male   | Female | Male   | Female |
|-----|--------|--------|--------|--------|--------|--------|
| 10  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 20  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 30  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 40  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 50  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 60  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 70  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 80  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 90  | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |
| 100 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 | 10.000 |



## DURATION OF LIFE IN SCOTLAND.

A SEPARATE set of returns was procured from Societies in Scotland, and the facts embodied in them have been combined into a distinct class of tables, to which reference will be presently made. The results thus derived will be of the more importance, as serving to confirm those obtained from the English Societies; and their value in this respect is enhanced by the fact, that the Scotch returns extend over a period of twelve years, while those by the English Societies were limited to five years. The Scotch returns were also made under quite different circumstances from those of the English, and they thus act as checks on each other. The nature and extent of the original form in which the information was furnished by the returns from Scotland, have already been referred to.

TABLE L represents the results for the Scotch Societies, in precisely the same manner that Table E did for the English Societies. The places forming the respective Districts in Scotland will be found in the Appendix, Note III.

TABLES M and N were subsequently formed from Table L, in the same manner in which Tables C and D were formed from B, and Tables F and G from E. An inspection of TABLE M for the Rural Districts, will shew that the Specific Intensity increases in a uniform ratio, from the earliest age in the Table to the extreme of life. A comparison with the Rural Districts of England (Table F) will shew a higher Specific Intensity in the Rural Districts of Scotland till age 34; but from that till age 54 it is lower in Scotland, and from 54 to the end of the Tables the Specific Intensity is sometimes higher and sometimes lower. A more general and comprehensive view of the two Tables will be obtained by comparing the Equation of Life: for age 10 it takes place between the ages 67-8 in the Rural Districts in Scotland, but between ages 68-9 in England. Again the Equation for age 30 takes place in both Tables between 70 and 71. Considering the different sources from which the data of the two Tables are derived, and the different periods of years over which the observations extend, the agreement of the Tables in this respect is somewhat remarkable.

[In the Town of



TABLE L.

TRADES NOT CLASSIFIED.—SCOTLAND.—RURAL DISTRICTS.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 10   | ...          | ...         | ...          | ...         | ...       | ...          | ...         | ...        | 10   |
| 11   | 2            | 33          | ...          | ...         | ...       | ...          | ...         | ...        | 11   |
| 12   | 5            |             | ...          | ...         | ...       | ...          | ...         | ...        | 12   |
| 13   | 6            |             | ...          | ...         | ...       | ...          | ...         | ...        | 13   |
| 14   | 8            |             | ...          | ...         | ...       | ...          | ...         | ...        | 14   |
| 15   | 12           | 906         | ...          | ...         | ...       | 7·714        | 802·713     | 0·8860     | 15   |
| 16   | 37           |             | 1            | 6           | 0·6623    | 48·428       |             |            | 16   |
| 17   | 83           |             | 1            | ...         | ...       | 128·714      |             |            | 17   |
| 18   | 162          |             | 1            | ...         | ...       | 261·143      |             |            | 18   |
| 19   | 264          | 3573        | 3            | ...         | ...       | 356·714      | 3070·570    | 0·8594     | 19   |
| 20   | 360          |             | 1            | 24          | 0·6717    | 496·286      |             |            | 20   |
| 21   | 488          |             | 5            | ...         | ...       | 496·571      |             |            | 21   |
| 22   | 610          |             | 4            | ...         | ...       | 521·428      |             |            | 22   |
| 23   | 717          | 6058        | 7            | ...         | ...       | 690·714      | 4645·000    | 0·7667     | 23   |
| 24   | 804          |             | 7            | ...         | ...       | 865·571      |             |            | 24   |
| 25   | 954          |             | 4            | ...         | ...       | 964·286      |             |            | 25   |
| 26   | 1067         |             | 10           | 41          | 0·6768    | 983·000      |             |            | 26   |
| 27   | 1161         | 6770        | 10           | ...         | ...       | 817·000      | 4881·428    | 0·7210     | 27   |
| 28   | 1220         |             | 6            | ...         | ...       | 862·286      |             |            | 28   |
| 29   | 1290         |             | 11           | ...         | ...       | 1018·428     |             |            | 29   |
| 30   | 1320         |             | 11           | ...         | ...       | 911·857      |             |            | 30   |
| 31   | 1364         | 6774        | 8            | ...         | ...       | 827·857      | 5806·855    | 0·8572     | 31   |
| 32   | 1372         |             | 12           | 45          | 0·6647    | 1037·000     |             |            | 32   |
| 33   | 1357         |             | 5            | ...         | ...       | 941·714      |             |            | 33   |
| 34   | 1336         |             | 9            | ...         | ...       | 1163·000     |             |            | 34   |
| 35   | 1341         | 6211        | 14           | ...         | ...       | 1180·428     | 6580·428    | 1·0595     | 35   |
| 36   | 1372         |             | 17           | ...         | ...       | 1253·714     |             |            | 36   |
| 37   | 1360         |             | 3            | 58          | 0·8562    | 998·571      |             |            | 37   |
| 38   | 1341         |             | 15           | ...         | ...       | 1172·714     |             |            | 38   |
| 39   | 1362         | 6211        | 9            | ...         | ...       | 1201·428     | 7538·713    | 1·3407     | 39   |
| 40   | 1339         |             | 14           | ...         | ...       | 1412·571     |             |            | 40   |
| 41   | 1335         |             | 10           | 53          | 0·8533    | 1212·286     |             |            | 41   |
| 42   | 1277         |             | 11           | ...         | ...       | 1435·571     |             |            | 42   |
| 43   | 1227         | 5623        | 11           | ...         | ...       | 1407·286     | 7538·713    | 1·3407     | 43   |
| 44   | 1191         |             | 8            | ...         | ...       | 1519·571     |             |            | 44   |
| 45   | 1181         |             | 7            | ...         | ...       | 1653·714     |             |            | 45   |
| 46   | 1172         |             | 20           | 65          | 1·1559    | 1495·857     |             |            | 46   |
| 47   | 1144         | 5623        | 12           | ...         | ...       | 1414·714     | 7538·713    | 1·3407     | 47   |
| 48   | 1128         |             | 11           | ...         | ...       | 1454·857     |             |            | 48   |
| 49   | 1105         |             | 15           | ...         | ...       | ...          |             |            | 49   |
| 50   | 1074         |             | ...          | ...         | ...       | ...          |             |            | 50   |



TABLE L.—(continued.)

TRADES NOT CLASSIFIED.—SCOTLAND.—RURAL DISTRICTS.

| Population. |              | DEATHS.     |              |             | SICKNESS. |              |             |            |      |
|-------------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
| Age.        | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            | Age. |
|             |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 51          | 1015         | 4630        | 12           | 61          | 1·3175    | 2014·714     | 10481·999   | 2·2639     | 51   |
| 52          | 979          |             | 13           |             |           | 2212·286     |             |            | 52   |
| 53          | 914          |             | 14           |             |           | 1830·857     |             |            | 53   |
| 54          | 888          |             | 10           |             |           | 2227·428     |             |            | 54   |
| 55          | 834          |             | 12           |             |           | 2196·714     |             |            | 55   |
| 56          | 791          | 3543        | 16           | 72          | 2·0322    | 2189·571     | 10844·285   | 3·0608     | 56   |
| 57          | 720          |             | 11           |             |           | 2181·000     |             |            | 57   |
| 58          | 709          |             | 16           |             |           | 1918·714     |             |            | 58   |
| 59          | 681          |             | 10           |             |           | 2220·286     |             |            | 59   |
| 60          | 642          |             | 19           |             |           | 2334·714     |             |            | 60   |
| 61          | 600          | 2497        | 11           | 84          | 3·3640    | 2125·000     | 12585·143   | 5·0401     | 61   |
| 62          | 552          |             | 13           |             |           | 2628·286     |             |            | 62   |
| 63          | 497          |             | 23           |             |           | 2197·428     |             |            | 63   |
| 64          | 446          |             | 18           |             |           | 2788·286     |             |            | 64   |
| 65          | 402          |             | 19           |             |           | 2846·143     |             |            | 65   |
| 66          | 347          | 1418        | 11           | 56          | 3·9490    | 3091·428     | 15388·713   | 10·8525    | 66   |
| 67          | 308          |             | 11           |             |           | 3245·286     |             |            | 67   |
| 68          | 282          |             | 9            |             |           | 2786·714     |             |            | 68   |
| 69          | 260          |             | 10           |             |           | 3017·857     |             |            | 69   |
| 70          | 221          |             | 15           |             |           | 3247·428     |             |            | 70   |
| 71          | 199          | 759         | 13           | 45          | 5·9289    | 2679·286     | 13450·000   | 17·7207    | 71   |
| 72          | 164          |             | 12           |             |           | 2559·286     |             |            | 72   |
| 73          | 143          |             | 8            |             |           | 2680·000     |             |            | 73   |
| 74          | 126          |             | 2            |             |           | 2585·571     |             |            | 74   |
| 75          | 127          |             | 10           |             |           | 2945·857     |             |            | 75   |
| 76          | 105          | 432         | 6            | 26          | 6·0185    | 2560·428     | 11611·999   | 26·8796    | 76   |
| 77          | 98           |             | 7            |             |           | 2531·000     |             |            | 77   |
| 78          | 81           |             | 5            |             |           | 2255·714     |             |            | 78   |
| 79          | 78           |             | 5            |             |           | 2180·857     |             |            | 79   |
| 80          | 70           |             | 3            |             |           | 2084·000     |             |            | 80   |
| 81          | 59           | 187         | 5            | 30          | 16·0248   | 1837·714     | 5463·714    | 29·2123    | 81   |
| 82          | 51           |             | 11           |             |           | 1547·000     |             |            | 82   |
| 83          | 36           |             | 6            |             |           | 1035·143     |             |            | 83   |
| 84          | 25           |             | 6            |             |           | 643·286      |             |            | 84   |
| 85          | 16           |             | 2            |             |           | 400·571      |             |            | 85   |
| 86          | 14           | 37          | 3            | 8           | 21·6216   | 423·428      | 1190·713    | 32·1814    | 86   |
| 87          | 9            |             | 2            |             |           | 294·428      |             |            | 87   |
| 88          | 7            |             | 1            |             |           | 236·571      |             |            | 88   |
| 89          | 4            |             | 1            |             |           | 143·143      |             |            | 89   |
| 90          | 3            |             | 1            |             |           | 93·143       |             |            | 90   |
| 91          | 1            | 1           | 1            | 1           | 100·0000  | 2·000        | 2·000       | 2·0000     | 91   |
| 92          | ...          |             | ...          |             |           | ...          |             |            | 92   |
| 93          | ...          |             | ...          |             |           | ...          |             |            | 93   |
| 94          | ...          |             | ...          |             |           | ...          |             |            | 94   |
| 95          | ...          |             | ...          |             |           | ...          |             |            | 95   |
|             |              | 49452       |              | 675         | 1·3705    |              | 114344·273  | 2·3216     |      |



## DURATION OF LIFE

TABLE L.—(continued.)

TRADES NOT CLASSIFIED.—SCOTLAND.—TOWNS.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 10   | 7            | 7           | ...          | ...         | ...       | ...          | ...         | ...        | 10   |
| 11   | 15           | 99          | ...          | ...         | ...       | 2·428        | 29·000      | 0·2929     | 11   |
| 12   | 19           |             | ...          |             |           | 12·000       |             |            | 12   |
| 13   | 17           |             | ...          |             |           | 10·286       |             |            | 13   |
| 14   | 21           |             | ...          |             |           | ...          |             |            | 14   |
| 15   | 27           |             | ...          |             |           | 4·286        |             |            | 15   |
| 16   | 38           | 436         | 1            | 3           | 0·6881    | 24·143       | 345·856     | 0·7930     | 16   |
| 17   | 57           |             | ...          |             |           | 28·714       |             |            | 17   |
| 18   | 86           |             | ...          |             |           | 91·857       |             |            | 18   |
| 19   | 120          |             | 1            |             |           | 100·428      |             |            | 19   |
| 20   | 135          |             | 1            |             |           | 100·714      |             |            | 20   |
| 21   | 176          | 1154        | 2            | 7           | 0·6066    | 157·286      | 1153·999    | 0·9999     | 21   |
| 22   | 206          |             | 3            |             |           | 271·571      |             |            | 22   |
| 23   | 243          |             | 1            |             |           | 245·714      |             |            | 23   |
| 24   | 253          |             | 1            |             |           | 187·428      |             |            | 24   |
| 25   | 276          |             | ...          |             |           | 292·000      |             |            | 25   |
| 26   | 303          | 1629        | 1            | 8           | 0·4911    | 336·286      | 1745·572    | 1·0716     | 26   |
| 27   | 314          |             | ...          |             |           | 387·286      |             |            | 27   |
| 28   | 334          |             | 2            |             |           | 421·286      |             |            | 28   |
| 29   | 343          |             | 4            |             |           | 339·000      |             |            | 29   |
| 30   | 335          |             | 1            |             |           | 261·714      |             |            | 30   |
| 31   | 306          | 1551        | 3            | 12          | 0·7737    | 312·571      | 1401·284    | 0·9035     | 31   |
| 32   | 338          |             | ...          |             |           | 272·428      |             |            | 32   |
| 33   | 333          |             | 3            |             |           | 276·000      |             |            | 33   |
| 34   | 324          |             | 4            |             |           | 251·714      |             |            | 34   |
| 35   | 250          |             | 2            |             |           | 288·571      |             |            | 35   |
| 36   | 289          | 1230        | 4            | 13          | 1·0569    | 219·714      | 1275·285    | 1·0368     | 36   |
| 37   | 268          |             | 2            |             |           | 242·000      |             |            | 37   |
| 38   | 253          |             | 3            |             |           | 303·857      |             |            | 38   |
| 39   | 222          |             | 2            |             |           | 266·000      |             |            | 39   |
| 40   | 198          |             | 2            |             |           | 243·714      |             |            | 40   |
| 41   | 179          | 744         | 3            | 6           | 0·8064    | 169·143      | 747·714     | 1·0050     | 41   |
| 42   | 160          |             | 1            |             |           | 174·000      |             |            | 42   |
| 43   | 150          |             | ...          |             |           | 161·000      |             |            | 43   |
| 44   | 130          |             | 1            |             |           | 146·571      |             |            | 44   |
| 45   | 125          |             | 1            |             |           | 97·000       |             |            | 45   |
| 46   | 120          | 471         | 5            | 10          | 2·1231    | 163·571      | 837·285     | 1·7777     | 46   |
| 47   | 99           |             | ...          |             |           | 189·714      |             |            | 47   |
| 48   | 93           |             | 3            |             |           | 201·000      |             |            | 48   |
| 49   | 85           |             | 1            |             |           | 151·000      |             |            | 49   |
| 50   | 74           |             | 1            |             |           | 132·000      |             |            | 50   |



TABLE L.—(continued.)

## TRADES NOT CLASSIFIED.—SCOTLAND.—TOWNS.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 51   | 75           | 319         | ...          | 2           | 0·6270    | 74·000       | 533·000     | 1·6708     | 51   |
| 52   | 69           |             | ...          |             |           | 117·000      |             |            | 52   |
| 53   | 63           |             | ...          |             |           | 101·000      |             |            | 53   |
| 54   | 57           |             | 1            |             |           | 125·000      |             |            | 54   |
| 55   | 55           |             | 1            |             |           | 116·000      |             |            | 55   |
| 56   | 44           | 199         | 2            | 4           | 2·0101    | 78·000       | 227·000     | 1·1407     | 56   |
| 57   | 41           |             | ...          |             |           | 39·000       |             |            | 57   |
| 58   | 42           |             | 1            |             |           | 28·000       |             |            | 58   |
| 59   | 39           |             | ...          |             |           | 50·000       |             |            | 59   |
| 60   | 33           |             | 1            |             |           | 32·000       |             |            | 60   |
| 61   | 31           | 126         | ...          | 4           | 3·1746    | 32·000       | 259·428     | 2·0589     | 61   |
| 62   | 28           |             | ...          |             |           | 22·000       |             |            | 62   |
| 63   | 24           |             | ...          |             |           | 53·428       |             |            | 63   |
| 64   | 24           |             | 4            |             |           | 57·000       |             |            | 64   |
| 65   | 19           |             | ...          |             |           | 95·000       |             |            | 65   |
| 66   | 16           | 64          | 3            | 7           | 10·9375   | 127·000      | 461·000     | 7·2031     | 66   |
| 67   | 16           |             | 1            |             |           | 89·000       |             |            | 67   |
| 68   | 13           |             | 2            |             |           | 59·000       |             |            | 68   |
| 69   | 12           |             | 1            |             |           | 124·000      |             |            | 69   |
| 70   | 7            |             | ...          |             |           | 62·000       |             |            | 70   |
| 71   | 8            | 36          | ...          | 1           | 2·7777    | 73·000       | 474·000     | 13·1666    | 71   |
| 72   | 7            |             | ...          |             |           | 35·000       |             |            | 72   |
| 73   | 8            |             | ...          |             |           | 140·000      |             |            | 73   |
| 74   | 7            |             | 1            |             |           | 114·000      |             |            | 74   |
| 75   | 6            |             | ...          |             |           | 112·000      |             |            | 75   |
| 76   | 7            | 25          | 1            | 4           | 16·0000   | 104·286      | 353·286     | 14·1314    | 76   |
| 77   | 7            |             | ...          |             |           | 71·000       |             |            | 77   |
| 78   | 7            |             | 2            |             |           | 109·000      |             |            | 78   |
| 79   | 2            |             | 1            |             |           | 17·000       |             |            | 79   |
| 80   | 2            |             | ...          |             |           | 52·000       |             |            | 80   |
| 81   | 2            | 11          | ...          | 1           | 9·0000    | 52·000       | 142·000     | 12·9090    | 81   |
| 82   | 2            |             | ...          |             |           | 52·000       |             |            | 82   |
| 83   | 2            |             | ...          |             |           | ...          |             |            | 83   |
| 84   | 3            |             | ...          |             |           | ...          |             |            | 84   |
| 85   | 2            |             | 1            |             |           | 38·000       |             |            | 85   |
| 86   | 1            | 5           | ...          | ...         | ...       | 52·000       | 233·000     | 46·6000    | 86   |
| 87   | 1            |             | ...          |             |           | 25·000       |             |            | 87   |
| 88   | 1            |             | ...          |             |           | 52·000       |             |            | 88   |
| 89   | 1            |             | ...          |             |           | 52·000       |             |            | 89   |
| 90   | 1            |             | ...          |             |           | 52·000       |             |            | 90   |
| 91   | 1            | 2           | ...          | ...         | ...       | ...          | ...         | ...        | 91   |
| 92   | 1            |             | ...          |             |           | ...          |             |            | 92   |
| 93   | ...          |             | ...          |             |           | ...          |             |            | 93   |
| 94   | ...          |             | ...          |             |           | ...          |             |            | 94   |
| 95   | ...          |             | ...          |             |           | ...          |             |            | 95   |
| 8108 |              |             | 82           | 1·0113      |           | 10218·709    | 1·2603      |            |      |



## DURATION OF LIFE

TABLE L.—(continued.)

TRADES NOT CLASSIFIED.—SCOTLAND.—CITIES.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 10   | ...          | ...         | ...          | ...         | ...       | ...          | ...         | ...        | 10   |
| 11   | ...          |             | ...          |             |           | ...          |             |            | 11   |
| 12   | ...          |             | ...          |             |           | ...          |             |            | 12   |
| 13   | ...          | ...         | ...          | ...         | ...       | ...          | ...         | ...        | 13   |
| 14   | ...          |             | ...          |             |           | ...          |             |            | 14   |
| 15   | ...          |             | ...          |             |           | ...          |             |            | 15   |
| 16   | ...          |             | ...          |             |           | ...          |             |            | 16   |
| 17   | 1            | 21          | ...          |             |           | ...          |             |            | 17   |
| 18   | 1            |             | ...          | ...         | ...       | ...          | ...         | ...        | 18   |
| 19   | 2            |             | ...          |             |           | ...          |             |            | 19   |
| 20   | 17           |             | ...          |             |           | ...          |             |            | 20   |
| 21   | 39           | 645         | ...          |             |           | 23·286       |             |            | 21   |
| 22   | 76           |             | 1            |             |           | 47·714       |             |            | 22   |
| 23   | 128          |             | 4            | 10          | 1·5504    | 166·143      | 495·285     | 0·7679     | 23   |
| 24   | 174          |             | ...          |             |           | 117·714      |             |            | 24   |
| 25   | 228          |             | 5            |             |           | 140·428      |             |            | 25   |
| 26   | 288          | 1888        | 3            |             |           | 177·714      |             |            | 26   |
| 27   | 343          |             | 2            |             |           | 262·714      |             |            | 27   |
| 28   | 387          |             | 4            | 22          | 1·1653    | 366·286      | 1749·571    | 0·9267     | 28   |
| 29   | 424          |             | 8            |             |           | 515·857      |             |            | 29   |
| 30   | 446          |             | 5            |             |           | 427·000      |             |            | 30   |
| 31   | 476          | 2491        | 6            |             |           | 430·571      |             |            | 31   |
| 32   | 494          |             | 7            |             |           | 456·714      |             |            | 32   |
| 33   | 515          |             | 7            | 37          | 1·4853    | 592·143      | 2572·285    | 1·0326     | 33   |
| 34   | 500          |             | 9            |             |           | 621·286      |             |            | 34   |
| 35   | 506          |             | 8            |             |           | 471·571      |             |            | 35   |
| 36   | 505          | 2304        | 7            |             |           | 515·571      |             |            | 36   |
| 37   | 506          |             | 9            |             |           | 444·857      |             |            | 37   |
| 38   | 461          |             | 7            | 41          | 1·7795    | 402·857      | 2333·427    | 1·0128     | 38   |
| 39   | 432          |             | 10           |             |           | 502·571      |             |            | 39   |
| 40   | 400          |             | 8            |             |           | 467·571      |             |            | 40   |
| 41   | 383          | 1612        | 8            |             |           | 477·857      |             |            | 41   |
| 42   | 353          |             | 8            |             |           | 545·143      |             |            | 42   |
| 43   | 320          |             | 5            | 32          | 1·9852    | 297·714      | 1853·571    | 1·1499     | 43   |
| 44   | 291          |             | 10           |             |           | 318·714      |             |            | 44   |
| 45   | 265          |             | 1            |             |           | 214·143      |             |            | 45   |
| 46   | 262          | 1227        | 5            |             |           | 415·286      |             |            | 46   |
| 47   | 256          |             | 6            |             |           | 455·857      |             |            | 47   |
| 48   | 246          |             | 9            | 37          | 3·0155    | 508·857      | 2682·857    | 2·1865     | 48   |
| 49   | 232          |             | 9            |             |           | 571·000      |             |            | 49   |
| 50   | 231          |             | 8            |             |           | 731·857      |             |            | 50   |
| 51   | 223          | 1065        | 5            |             |           | 746·286      |             |            | 51   |
| 52   | 224          |             | 8            |             |           | 768·714      |             |            | 52   |
| 53   | 211          |             | 8            | 37          | 3·4742    | 671·571      | 3244·713    | 3·0467     | 53   |
| 54   | 211          |             | 12           |             |           | 570·571      |             |            | 54   |
| 55   | 196          |             | 4            |             |           | 487·571      |             |            | 55   |



TABLE L.—(continued.)

TRADES NOT CLASSIFIED.—SCOTLAND.—CITIES.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age.      |        |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|-----------|--------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |           |        |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |           |        |
| 56   | 193          | 829         | 12           | 38          | 4.5838    | 713.714      | 3247.571    | 3.9175     | 56        |        |
| 57   | 179          |             | 8            |             |           | 716.286      |             |            | 57        |        |
| 58   | 167          |             | 5            |             |           | 597.143      |             |            | 58        |        |
| 59   | 153          |             | 6            |             |           | 608.714      |             |            | 59        |        |
| 60   | 137          |             | 7            |             |           | 611.714      |             |            | 60        |        |
| 61   | 120          | 462         | 5            | 21          | 4.5455    | 658.857      | 3065.141    | 6.8510     | 61        |        |
| 62   | 103          |             | 7            |             |           | 720.714      |             |            | 62        |        |
| 63   | 93           |             | 5            |             |           | 588.428      |             |            | 63        |        |
| 64   | 75           |             | ...          |             |           | 531.714      |             |            | 64        |        |
| 65   | 71           |             | 4            |             |           | 565.428      |             |            | 65        |        |
| 66   | 62           | 234         | 5            | 11          | 4.7009    | 427.571      | 2361.142    | 10.0904    | 66        |        |
| 67   | 52           |             | 1            |             |           | 485.000      |             |            | 67        |        |
| 68   | 44           |             | 1            |             |           | 577.857      |             |            | 68        |        |
| 69   | 41           |             | 2            |             |           | 503.714      |             |            | 69        |        |
| 70   | 35           |             | 2            |             |           | 367.000      |             |            | 70        |        |
| 71   | 30           | 130         | 1            | 12          | 9.2308    | 526.286      | 3128.572    | 24.0659    | 71        |        |
| 72   | 29           |             | ...          |             |           | 698.286      |             |            | 72        |        |
| 73   | 26           |             | 2            |             |           | 654.000      |             |            | 73        |        |
| 74   | 25           |             | 4            |             |           | 695.000      |             |            | 74        |        |
| 75   | 20           |             | 5            |             |           | 555.000      |             |            | 75        |        |
| 76   | 15           | 49          | 1            | 4           | 8.1632    | 486.000      | 1717.714    | 35.0554    | 76        |        |
| 77   | 10           |             | 1            |             |           | 300.000      |             |            | 77        |        |
| 78   | 9            |             | ...          |             |           | 316.000      |             |            | 78        |        |
| 79   | 8            |             | 1            |             |           | 320.000      |             |            | 79        |        |
| 80   | 7            |             | 1            |             |           | 295.714      |             |            | 80        |        |
| 81   | 6            | 16          | 1            | 3           | 18.7500   | 311.000      | 791.000     | 49.4375    | 81        |        |
| 82   | 4            |             | ...          |             |           | 208.000      |             |            | 82        |        |
| 83   | 4            |             | 2            |             |           | 168.000      |             |            | 83        |        |
| 84   | 1            |             | ...          |             |           | 52.000       |             |            | 84        |        |
| 85   | 1            |             | ...          |             |           | 52.000       |             |            | 85        |        |
| 86   | 1            | 3           | ...          | 0           | 0.0000    | 52.000       | 156.000     | 52.0000    | 86        |        |
| 87   | 1            |             | ...          |             |           | 52.000       |             |            | 87        |        |
| 88   | ...          |             | ...          |             |           | ...          |             |            | 88        |        |
| 89   | ...          |             | ...          |             |           | ...          |             |            | 89        |        |
| 90   | 1            |             | ...          |             |           | 52.000       |             |            | 90        |        |
| 91   | 1            | 5           | ...          | 0           | 0.0000    | 52.000       | 260.000     | 52.0000    | 91        |        |
| 92   | 1            |             | ...          |             |           | 52.000       |             |            | 92        |        |
| 93   | 1            |             | ...          |             |           | 52.000       |             |            | 93        |        |
| 94   | 1            |             | ...          |             |           | 52.000       |             |            | 94        |        |
| 95   | 1            |             | ...          |             |           | 52.000       |             |            | 95        |        |
| 96   | 1            | 1           | 1            | 1           | 100.0000  | 41.000       | 41.000      | 41.0000    | 96        |        |
| 97   | ...          |             | ...          |             |           | ...          |             |            | 97        |        |
| 98   | ...          |             | ...          |             |           | ...          |             |            | 98        |        |
| 99   | ...          |             | ...          |             |           | ...          |             |            | 99        |        |
| 100  | ...          |             | ...          |             |           | ...          |             |            | 100       |        |
|      |              | 12982       |              |             | 306       | 2.3571       |             |            | 29699.849 | 2.2878 |



## DURATION OF LIFE

TABLE L.—(Continued.)

TRADES NOT CLASSIFIED.—SCOTLAND.—RURAL, TOWN, AND CITY DISTRICTS.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total,      | Per Annum. |      |
| 10   | 7            | 7           | ...          | ...         | ...       | ...          | ...         | ...        | 10   |
| 11   | 17           | 132         | ...          | ...         | ...       | 2.428        | 29.000      | 0.2197     | 11   |
| 12   | 24           |             | ...          |             |           | 12.000       |             |            | 12   |
| 13   | 23           |             | ...          |             |           | 10.286       |             |            | 13   |
| 14   | 29           |             | ...          |             |           | ...          |             |            | 14   |
| 15   | 39           |             | ...          |             |           | 4.286        |             |            | 15   |
| 16   | 75           | 1363        | 1            | 9           | 0.6603    | 31.857       | 1148.570    | 0.8427     | 16   |
| 17   | 141          |             | 1            |             |           | 77.143       |             |            | 17   |
| 18   | 249          |             | 1            |             |           | 220.571      |             |            | 18   |
| 19   | 386          |             | 2            |             |           | 361.571      |             |            | 19   |
| 20   | 512          |             | 4            |             |           | 457.428      |             |            | 20   |
| 21   | 703          | 5372        | 3            | 41          | 0.7633    | 676.857      | 4719.857    | 0.8786     | 21   |
| 22   | 892          |             | 9            |             |           | 815.857      |             |            | 22   |
| 23   | 1088         |             | 9            |             |           | 933.286      |             |            | 23   |
| 24   | 1231         |             | 8            |             |           | 995.857      |             |            | 24   |
| 25   | 1458         |             | 12           |             |           | 1298.000     |             |            | 25   |
| 26   | 1658         | 9575        | 8            | 71          | 0.7415    | 1478.286     | 8140.143    | 0.8501     | 26   |
| 27   | 1818         |             | 12           |             |           | 1633.000     |             |            | 27   |
| 28   | 1941         |             | 16           |             |           | 1604.571     |             |            | 28   |
| 29   | 2057         |             | 18           |             |           | 1717.143     |             |            | 29   |
| 30   | 2101         |             | 17           |             |           | 1707.143     |             |            | 30   |
| 31   | 2146         | 10812       | 20           | 94          | 0.8694    | 1655.000     | 8855.000    | 0.8190     | 31   |
| 32   | 2204         |             | 15           |             |           | 1557.000     |             |            | 32   |
| 33   | 2205         |             | 22           |             |           | 1905.143     |             |            | 33   |
| 34   | 2160         |             | 18           |             |           | 1814.714     |             |            | 34   |
| 35   | 2097         |             | 19           |             |           | 1923.143     |             |            | 35   |
| 36   | 2166         | 10308       | 25           | 112         | 1.0865    | 1915.714     | 9415.571    | 0.9134     | 36   |
| 37   | 2134         |             | 28           |             |           | 1940.571     |             |            | 37   |
| 38   | 2055         |             | 13           |             |           | 1705.286     |             |            | 38   |
| 39   | 2016         |             | 27           |             |           | 1941.286     |             |            | 39   |
| 40   | 1937         |             | 19           |             |           | 1912.714     |             |            | 40   |
| 41   | 1897         | 8567        | 25           | 91          | 1.0622    | 2059.571     | 9181.713    | 1.0717     | 41   |
| 42   | 1790         |             | 19           |             |           | 1831.857     |             |            | 42   |
| 43   | 1697         |             | 15           |             |           | 1671.000     |             |            | 43   |
| 44   | 1612         |             | 22           |             |           | 1900.857     |             |            | 44   |
| 45   | 1571         |             | 10           |             |           | 1718.428     |             |            | 45   |
| 46   | 1554         | 7321        | 17           | 112         | 1.5298    | 2098.428     | 11058.856   | 1.5106     | 46   |
| 47   | 1499         |             | 26           |             |           | 2299.286     |             |            | 47   |
| 48   | 1467         |             | 24           |             |           | 2205.714     |             |            | 48   |
| 49   | 1422         |             | 21           |             |           | 2136.714     |             |            | 49   |
| 50   | 1379         |             | 24           |             |           | 2318.714     |             |            | 50   |
| 51   | 1313         | 6014        | 17           | 100         | 1.6628    | 2835.000     | 14259.714   | 2.3711     | 51   |
| 52   | 1272         |             | 21           |             |           | 3098.000     |             |            | 52   |
| 53   | 1188         |             | 22           |             |           | 2603.428     |             |            | 53   |
| 54   | 1156         |             | 23           |             |           | 2923.000     |             |            | 54   |
| 55   | 1085         |             | 17           |             |           | 2800.286     |             |            | 55   |



TABLE L.—(continued.)

TRADES NOT CLASSIFIED.—SCOTLAND.—RURAL, TOWN, AND CITY DISTRICTS.

| Age. | Population.  |             | DEATHS.      |             |           | SICKNESS.    |             |            | Age. |
|------|--------------|-------------|--------------|-------------|-----------|--------------|-------------|------------|------|
|      | At Each Age. | In Periods. | At Each Age. | In Periods. |           | At Each Age. | In Periods. |            |      |
|      |              |             |              | Total.      | Per Cent. |              | Total.      | Per Annum. |      |
| 56   | 1028         | 4571        | 30           | 114         | 2.4940    | 2981.286     | 14318.857   | 3.1325     | 56   |
| 57   | 940          |             | 19           |             |           | 2936.286     |             |            | 57   |
| 58   | 918          |             | 22           |             |           | 2543.857     |             |            | 58   |
| 59   | 873          |             | 16           |             |           | 2879.000     |             |            | 59   |
| 60   | 812          |             | 27           |             |           | 2978.428     |             |            | 60   |
| 61   | 751          | 3085        | 16           | 109         | 3.5332    | 2815.857     | 15909.714   | 5.1571     | 61   |
| 62   | 683          |             | 20           |             |           | 3371.000     |             |            | 62   |
| 63   | 614          |             | 28           |             |           | 2839.286     |             |            | 63   |
| 64   | 545          |             | 22           |             |           | 3337.000     |             |            | 64   |
| 65   | 492          |             | 23           |             |           | 3506.571     |             |            | 65   |
| 66   | 425          | 1716        | 19           | 74          | 4.3124    | 3646.000     | 18210.856   | 10.6123    | 66   |
| 67   | 376          |             | 13           |             |           | 3819.286     |             |            | 67   |
| 68   | 339          |             | 12           |             |           | 3423.571     |             |            | 68   |
| 69   | 313          |             | 13           |             |           | 3645.571     |             |            | 69   |
| 70   | 263          |             | 17           |             |           | 3676.428     |             |            | 70   |
| 71   | 237          | 925         | 14           | 58          | 6.2703    | 3278.571     | 17052.570   | 18.4352    | 71   |
| 72   | 200          |             | 12           |             |           | 3292.571     |             |            | 72   |
| 73   | 177          |             | 10           |             |           | 3474.000     |             |            | 73   |
| 74   | 158          |             | 7            |             |           | 3394.571     |             |            | 74   |
| 75   | 153          |             | 15           |             |           | 3612.857     |             |            | 75   |
| 76   | 127          | 506         | 8            | 34          | 6.7194    | 3150.714     | 13682.999   | 27.0415    | 76   |
| 77   | 115          |             | 8            |             |           | 2902.000     |             |            | 77   |
| 78   | 97           |             | 7            |             |           | 2680.714     |             |            | 78   |
| 79   | 88           |             | 7            |             |           | 2517.857     |             |            | 79   |
| 80   | 79           |             | 4            |             |           | 2431.714     |             |            | 80   |
| 81   | 67           | 214         | 6            | 34          | 15.8879   | 2200.714     | 6395.714    | 29.8865    | 81   |
| 82   | 57           |             | 11           |             |           | 1807.000     |             |            | 82   |
| 83   | 42           |             | 8            |             |           | 1202.143     |             |            | 83   |
| 84   | 29           |             | 6            |             |           | 695.286      |             |            | 84   |
| 85   | 19           |             | 3            |             |           | 490.571      |             |            | 85   |
| 86   | 16           | 45          | 3            | 8           | 17.7777   | 527.428      | 1579.713    | 35.1047    | 86   |
| 87   | 11           |             | 2            |             |           | 371.428      |             |            | 87   |
| 88   | 8            |             | 1            |             |           | 288.571      |             |            | 88   |
| 89   | 5            |             | 1            |             |           | 195.143      |             |            | 89   |
| 90   | 5            |             | 1            |             |           | 197.143      |             |            | 90   |
| 91   | 3            | 8           | 1            | 1           | 12.5000   | 54.000       | 262.000     | 32.7500    | 91   |
| 92   | 2            |             | ...          |             |           | 52.000       |             |            | 92   |
| 93   | 1            |             | ...          |             |           | 52.000       |             |            | 93   |
| 94   | 1            |             | ...          |             |           | 52.000       |             |            | 94   |
| 95   | 1            |             | ...          |             |           | 52.000       |             |            | 95   |
| 96   | 1            | 1           | 1            | 1           | 100.0000  | 41.000       | 41.000      | 41.0000    | 96   |
| 97   | ...          |             | ...          |             |           | ...          |             |            | 97   |
| 98   | ...          |             | ...          |             |           | ...          |             |            | 98   |
| 99   | ...          |             | ...          |             |           | ...          |             |            | 99   |
| 100  | ...          |             | ...          |             |           | ...          |             |            | 100  |
|      |              | 70542       |              | 1063        | 1.5069    |              | 154261.847  | 2.1868     |      |



In the Town Districts of Scotland, half the population dies off at the ages of 65-6; but in the Town Districts in England, the same thing takes place a year earlier. It is in the City Districts of Scotland that the most marked difference is found; but when it is recollected that the only places included in the list of Scotch Cities are Edinburgh, Glasgow, Paisley, and Aberdeen, and that the observations relate chiefly to the three first-named places, it will in some measure account for the very high rate of Mortality. An inspection of the City Districts of TABLE M will shew a much lower specific intensity for Scotland up to age 60, than even for Liverpool; but from that age to 80 it is higher than in Liverpool. In the City Districts for Scotland, half the population dies off between the ages of 53-4, being eight years earlier than in the City Districts of England, and five years sooner than in Liverpool, and in fact coming very close to the very worst class of results in England—namely, Clerks—in which half the population was cut off at ages 51-2. But as the numbers over which the observations extend in the City Districts in Scotland are limited, less confidence might reasonably be placed in the results, and the excessive mortality in part assigned to the fluctuation to which small numbers are subject.

On examination, however, of the various groups of results making up the whole class for the City Districts, they were, without exception, found subject to a high rate of mortality, thus carrying evidence of a higher absolute mortality than in the average of English Cities.

The results for the Three Districts combined shew a less specific intensity than in England up to age 66, and from that age upwards, the Tables cross each other. In the general results for Scotland, half of the population dies off between ages 64-5; but in the general results for England, that event is deferred two years beyond that period.

Looking next to the Expectation of Life, as given in TABLE N, it will be found that in the Rural Districts of Scotland it is less than in England by about half-a-year, from ages 20 to 75; but the Town Districts of Scotland give a higher Expectation than in England till beyond 70 years of age, and the City Districts of Scotland shew a lower Expectation of Life than Liverpool up to about 50 years of age. In order to admit of better comparison, the general results for the Three Districts in Scotland and England will be arranged as follows for decennial ages.

| Age. | Expectation of Life in Friendly Societies in |          | Difference in favour of<br>England in Years. |
|------|----------------------------------------------|----------|----------------------------------------------|
|      | Scotland.                                    | England. |                                              |
| 20   | 42.7218                                      | 43.7736  | 1.0518                                       |
| 30   | 35.6512                                      | 36.6051  | 0.9539                                       |
| 40   | 28.6565                                      | 29.3306  | 0.6741                                       |
| 50   | 21.8122                                      | 22.1920  | 0.3798                                       |
| 60   | 15.0184                                      | 15.6942  | 0.6758                                       |
| 70   | 10.4296                                      | 10.2057  | —0.2239                                      |

[From a consideration



TABLE M.  
RURAL DISTRICTS.—SCOTLAND.

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 230    | ·2300                  | 434·783                | 56   | 69492   | 1214   | 1·7463                 | 57·274                 |
| 11   | 99770   | 229    | ·2300                  | 434·783                | 57   | 68278   | 1307   | 1·9139                 | 52·247                 |
| 12   | 99541   | 246    | ·2473                  | 404·367                | 58   | 66971   | 1411   | 2·1062                 | 47·483                 |
| 13   | 99295   | 280    | ·2818                  | 354·862                | 59   | 65560   | 1523   | 2·3232                 | 43·948                 |
| 14   | 99015   | 330    | ·3337                  | 299·670                | 60   | 64037   | 1643   | 2·5649                 | 38·986                 |
| 15   | 98685   | 398    | ·4029                  | 248·201                | 61   | 62394   | 1767   | 2·8312                 | 35·323                 |
| 16   | 98287   | 481    | ·4893                  | 204·374                | 62   | 60627   | 1860   | 3·0677                 | 32·594                 |
| 17   | 97806   | 547    | ·5589                  | 178·923                | 63   | 58767   | 1924   | 3·2744                 | 30·544                 |
| 18   | 97259   | 595    | ·6115                  | 163·532                | 64   | 56843   | 1962   | 3·4511                 | 28·977                 |
| 19   | 96664   | 626    | ·6472                  | 154·512                | 65   | 54881   | 1975   | 3·5980                 | 27·793                 |
| 20   | 96038   | 640    | ·6660                  | 150·150                | 66   | 52906   | 1966   | 3·7150                 | 26·918                 |
| 21   | 95398   | 637    | ·6679                  | 149·723                | 67   | 50940   | 1980   | 3·8878                 | 25·720                 |
| 22   | 94761   | 635    | ·6696                  | 149·343                | 68   | 48960   | 2015   | 4·1164                 | 24·295                 |
| 23   | 94126   | 632    | ·6712                  | 148·987                | 69   | 46945   | 2066   | 4·4007                 | 22·722                 |
| 24   | 93494   | 629    | ·6724                  | 148·721                | 70   | 44879   | 2132   | 4·7509                 | 21·038                 |
| 25   | 92865   | 626    | ·6736                  | 148·456                | 71   | 42747   | 2196   | 5·1369                 | 19·467                 |
| 26   | 92239   | 622    | ·6747                  | 148·214                | 72   | 40551   | 2213   | 5·4573                 | 18·325                 |
| 27   | 91617   | 618    | ·6750                  | 148·148                | 73   | 38338   | 2186   | 5·7020                 | 17·538                 |
| 28   | 90999   | 614    | ·6747                  | 148·214                | 74   | 36152   | 2123   | 5·8712                 | 17·033                 |
| 29   | 90385   | 609    | ·6736                  | 148·456                | 75   | 34029   | 2030   | 5·9647                 | 16·764                 |
| 30   | 89776   | 603    | ·6719                  | 148·832                | 76   | 31999   | 1914   | 5·9826                 | 16·714                 |
| 31   | 89173   | 597    | ·6695                  | 149·365                | 77   | 30085   | 1925   | 6·3979                 | 15·630                 |
| 32   | 88576   | 598    | ·6752                  | 148·104                | 78   | 28160   | 2031   | 7·2106                 | 18·868                 |
| 33   | 87978   | 606    | ·6891                  | 145·117                | 79   | 26129   | 2200   | 8·4207                 | 11·875                 |
| 34   | 87372   | 621    | ·7111                  | 140·627                | 80   | 23929   | 2400   | 10·0282                | 9·970                  |
| 35   | 86751   | 643    | ·7413                  | 134·898                | 81   | 21529   | 2591   | 12·0330                | 8·313                  |
| 36   | 86108   | 671    | ·7796                  | 128·271                | 82   | 18938   | 2625   | 13·8601                | 7·215                  |
| 37   | 85437   | 692    | ·8101                  | 123·442                | 83   | 16313   | 2530   | 15·5093                | 6·447                  |
| 38   | 34745   | 706    | ·8329                  | 120·062                | 84   | 13783   | 2341   | 16·9807                | 5·889                  |
| 39   | 84039   | 712    | ·8478                  | 117·952                | 85   | 11442   | 2091   | 18·2743                | 5·473                  |
| 40   | 83327   | 712    | ·8550                  | 116·959                | 86   | 9351    | 1813   | 19·3900                | 5·157                  |
| 41   | 82615   | 706    | ·8544                  | 117·041                | 87   | 7538    | 1533   | 20·3326                | 4·919                  |
| 42   | 81909   | 709    | ·8655                  | 115·540                | 88   | 6005    | 1267   | 21·1019                | 4·739                  |
| 43   | 81200   | 722    | ·8887                  | 112·524                | 89   | 4738    | 1028   | 21·6980                | 4·608                  |
| 44   | 80478   | 744    | ·9242                  | 108·202                | 90   | 3710    | 821    | 22·1209                | 4·521                  |
| 45   | 79734   | 775    | ·9719                  | 102·891                | 91   | 2889    | 646    | 22·3706                | 4·470                  |
| 46   | 78959   | 815    | 1·0324                 | 96·899                 | 92   | 2243    | 535    | 23·8316                | 4·196                  |
| 47   | 78144   | 850    | 1·0879                 | 91·912                 | 93   | 1708    | 453    | 26·5040                | 3·774                  |
| 48   | 77294   | 879    | 1·1377                 | 87·873                 | 94   | 1255    | 381    | 30·3877                | 3·291                  |
| 49   | 76415   | 903    | 1·1819                 | 84·602                 | 95   | 874     | 310    | 35·4808                | 2·818                  |
| 50   | 75512   | 922    | 1·2205                 | 81·900                 | 96   | 564     | 236    | 41·7892                | 2·393                  |
| 51   | 74590   | 934    | 1·2528                 | 79·808                 | 97   | 328     | 161    | 49·1613                | 2·034                  |
| 52   | 73656   | 963    | 1·3073                 | 76·511                 | 98   | 167     | 98     | 59·0648                | 1·693                  |
| 53   | 72693   | 1006   | 1·3838                 | 72·254                 | 99   | 69      | 45     | 66·0370                | 1·514                  |
| 54   | 71687   | 1063   | 1·4825                 | 67·431                 | 100  | 24      | 24     | 85·0000                | 1·176                  |
| 55   | 70624   | 1132   | 1·6033                 | 62·383                 |      |         |        |                        |                        |



## DURATION OF LIFE

TABLE M.—(continued.)

TOWNS.—SCOTLAND.

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 275    | ·2750                  | 363·636                | 56   | 67829   | 988    | 1·4568                 | 68·634                 |
| 11   | 99725   | 274    | ·2750                  | 363·636                | 57   | 66841   | 1153   | 1·7247                 | 57·971                 |
| 12   | 99451   | 290    | ·2915                  | 343·053                | 58   | 65688   | 1303   | 1·9838                 | 50·403                 |
| 13   | 99161   | 322    | ·3246                  | 308·072                | 59   | 64385   | 1439   | 2·2342                 | 44·763                 |
| 14   | 98839   | 370    | ·3741                  | 267·308                | 60   | 62946   | 1559   | 2·4759                 | 40·388                 |
| 15   | 98469   | 433    | ·4402                  | 227·170                | 61   | 61387   | 1663   | 2·7088                 | 36·914                 |
| 16   | 98036   | 513    | ·5228                  | 191·278                | 62   | 59724   | 1915   | 3·2056                 | 31·192                 |
| 17   | 97523   | 571    | ·5857                  | 170·736                | 63   | 57809   | 2293   | 3·9664                 | 25·214                 |
| 18   | 96952   | 610    | ·6287                  | 159·058                | 64   | 55516   | 2771   | 4·9911                 | 20·036                 |
| 19   | 96342   | 628    | ·6520                  | 153·374                | 65   | 52745   | 3312   | 6·2797                 | 15·924                 |
| 20   | 95714   | 627    | ·6555                  | 152·555                | 66   | 49433   | 3872   | 7·8323                 | 12·768                 |
| 21   | 95087   | 608    | ·6392                  | 156·446                | 67   | 45561   | 3986   | 8·7480                 | 11·431                 |
| 22   | 94479   | 587    | ·6215                  | 160·901                | 68   | 41575   | 3753   | 9·0267                 | 11·078                 |
| 23   | 93892   | 566    | ·6025                  | 165·975                | 69   | 37822   | 3279   | 8·6686                 | 11·535                 |
| 24   | 93326   | 543    | ·5821                  | 171·792                | 70   | 34543   | 2651   | 7·6735                 | 13·031                 |
| 25   | 92783   | 520    | ·5604                  | 178·444                | 71   | 31892   | 1927   | 6·0416                 | 16·551                 |
| 26   | 92263   | 496    | ·5373                  | 186·116                | 72   | 29965   | 1578   | 5·2649                 | 18·993                 |
| 27   | 91767   | 486    | ·5301                  | 188·644                | 73   | 28387   | 1517   | 5·3435                 | 18·713                 |
| 28   | 91281   | 492    | ·5389                  | 185·563                | 74   | 26870   | 1687   | 6·2774                 | 15·931                 |
| 29   | 90789   | 512    | ·5635                  | 177·462                | 75   | 25183   | 2031   | 8·0666                 | 12·396                 |
| 30   | 90277   | 545    | ·6041                  | 165·536                | 76   | 23152   | 2480   | 10·7110                | 9·337                  |
| 31   | 89732   | 593    | ·6606                  | 151·378                | 77   | 20672   | 2623   | 12·6885                | 7·880                  |
| 32   | 89139   | 639    | ·7172                  | 139·431                | 78   | 18049   | 2526   | 13·9967                | 7·143                  |
| 33   | 88500   | 685    | ·7737                  | 129·249                | 79   | 15523   | 2272   | 14·6378                | 6·831                  |
| 34   | 87815   | 729    | ·8303                  | 120·438                | 80   | 13251   | 1936   | 14·6112                | 6·845                  |
| 35   | 87086   | 772    | ·8869                  | 112·752                | 81   | 11315   | 1575   | 13·9168                | 7·184                  |
| 36   | 86314   | 814    | ·9436                  | 105·977                | 82   | 9740    | 1333   | 13·6887                | 7·305                  |
| 37   | 85500   | 837    | ·9789                  | 102·156                | 83   | 8407    | 1171   | 13·9270                | 7·179                  |
| 38   | 84663   | 841    | ·9928                  | 100·725                | 84   | 7236    | 1059   | 14·6315                | 6·835                  |
| 39   | 83822   | 826    | ·9854                  | 101·482                | 85   | 6177    | 976    | 15·8024                | 6·329                  |
| 40   | 82996   | 794    | ·9567                  | 104·526                | 86   | 5201    | 907    | 17·4396                | 5·734                  |
| 41   | 82202   | 745    | ·9066                  | 110·302                | 87   | 4294    | 827    | 19·2608                | 5·192                  |
| 42   | 81457   | 749    | ·9192                  | 108·790                | 88   | 3467    | 737    | 21·2660                | 4·701                  |
| 43   | 80708   | 803    | ·9944                  | 100·563                | 89   | 2730    | 635    | 23·2552                | 4·299                  |
| 44   | 79905   | 905    | 1·1324                 | 88·339                 | 90   | 2095    | 537    | 25·6284                | 3·902                  |
| 45   | 79000   | 1053   | 1·3330                 | 75·019                 | 91   | 1558    | 438    | 28·1856                | 3·547                  |
| 46   | 77947   | 1244   | 1·5964                 | 62·657                 | 92   | 1120    | 344    | 30·7328                | 3·254                  |
| 47   | 76703   | 1340   | 1·7472                 | 57·241                 | 93   | 776     | 258    | 33·2701                | 3·006                  |
| 48   | 75363   | 1346   | 1·7855                 | 55·991                 | 94   | 518     | 186    | 35·9973                | 2·778                  |
| 49   | 74017   | 1268   | 1·7133                 | 58·377                 | 95   | 332     | 128    | 38·5147                | 2·597                  |
| 50   | 72749   | 1107   | 1·5246                 | 65·574                 | 96   | 204     | 83     | 41·0220                | 2·438                  |
| 51   | 71642   | 878    | 1·2254                 | 81·633                 | 97   | 121     | 55     | 46·0819                | 2·170                  |
| 52   | 70764   | 737    | 1·0414                 | 96·061                 | 98   | 66      | 35     | 53·3790                | 1·873                  |
| 53   | 70027   | 681    | ·9725                  | 102·828                | 99   | 31      | 19     | 61·3067                | 1·631                  |
| 54   | 69346   | 707    | 1·0188                 | 98·135                 | 100  | 12      | 12     | 75·0000                | 1·331                  |
| 55   | 68639   | 810    | 1·1802                 | 84·746                 |      |         |        |                        |                        |



TABLE M.—(continued.)

## CITIES.—SCOTLAND.

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 396    | ·3961                  | 252·462                | 56   | 45206   | 1872   | 4·1399                 | 24·155                 |
| 11   | 99604   | 395    | ·3961                  | 252·462                | 57   | 43334   | 1870   | 4·3159                 | 23·170                 |
| 12   | 99209   | 401    | ·4038                  | 247·647                | 58   | 41464   | 1844   | 4·4460                 | 22·492                 |
| 13   | 98808   | 414    | ·4193                  | 238·493                | 59   | 39620   | 1795   | 4·5302                 | 22·075                 |
| 14   | 98394   | 435    | ·4425                  | 225·989                | 60   | 37825   | 1728   | 4·5684                 | 21·891                 |
| 15   | 97959   | 464    | ·4735                  | 211·193                | 61   | 36097   | 1646   | 4·5608                 | 21·925                 |
| 16   | 97495   | 499    | ·5123                  | 195·198                | 62   | 34451   | 1571   | 4·5608                 | 21·925                 |
| 17   | 96996   | 564    | ·5817                  | 171·910                | 63   | 32880   | 1502   | 4·5687                 | 21·887                 |
| 18   | 96432   | 657    | ·6818                  | 146·671                | 64   | 31378   | 1439   | 4·5843                 | 21·815                 |
| 19   | 95775   | 778    | ·8126                  | 123·062                | 65   | 29939   | 1379   | 4·6076                 | 21·701                 |
| 20   | 94997   | 925    | ·9740                  | 102·669                | 66   | 28560   | 1325   | 4·6387                 | 21·556                 |
| 21   | 94072   | 1097   | 1·1661                 | 85·763                 | 67   | 27235   | 1320   | 4·8448                 | 20·640                 |
| 22   | 92975   | 1213   | 1·3044                 | 76·687                 | 68   | 25915   | 1354   | 5·2258                 | 19·135                 |
| 23   | 91762   | 1275   | 1·3889                 | 71·994                 | 69   | 24561   | 1420   | 5·7818                 | 17·295                 |
| 24   | 90487   | 1285   | 1·4195                 | 70·423                 | 70   | 23141   | 1507   | 6·5128                 | 15·354                 |
| 25   | 89202   | 1246   | 1·3963                 | 71·633                 | 71   | 21634   | 1605   | 7·4188                 | 13·479                 |
| 26   | 87956   | 1160   | 1·3193                 | 75·815                 | 72   | 20029   | 1623   | 8·1009                 | 12·344                 |
| 27   | 86796   | 1103   | 1·2705                 | 78·678                 | 73   | 18406   | 1575   | 8·5591                 | 11·684                 |
| 28   | 85693   | 1071   | 1·2499                 | 80·000                 | 74   | 16831   | 1480   | 8·7933                 | 11·373                 |
| 29   | 84622   | 1064   | 1·2575                 | 79·491                 | 75   | 15351   | 1351   | 8·8037                 | 11·358                 |
| 30   | 83558   | 1081   | 1·2933                 | 77·340                 | 76   | 14000   | 1203   | 8·5902                 | 11·641                 |
| 31   | 82477   | 1119   | 1·3573                 | 73·692                 | 77   | 12797   | 1132   | 8·8429                 | 11·308                 |
| 32   | 81358   | 1156   | 1·4203                 | 70·423                 | 78   | 11665   | 1115   | 9·5617                 | 10·458                 |
| 33   | 80202   | 1189   | 1·4822                 | 67·476                 | 79   | 10550   | 1134   | 10·7467                | 9·302                  |
| 34   | 79013   | 1219   | 1·5431                 | 64·809                 | 80   | 9416    | 1167   | 12·3979                | 8·065                  |
| 35   | 77794   | 1247   | 1·6029                 | 62·383                 | 81   | 8249    | 1197   | 14·5152                | 6·887                  |
| 36   | 76547   | 1272   | 1·6618                 | 60·168                 | 82   | 7052    | 1165   | 16·5179                | 6·053                  |
| 37   | 75275   | 1293   | 1·7171                 | 58·241                 | 83   | 5887    | 1084   | 18·4060                | 5·432                  |
| 38   | 73982   | 1309   | 1·7688                 | 56·529                 | 84   | 4803    | 969    | 20·1794                | 4·955                  |
| 39   | 72673   | 1321   | 1·8170                 | 55·036                 | 85   | 3834    | 837    | 21·8382                | 4·579                  |
| 40   | 71352   | 1328   | 1·8617                 | 53·706                 | 86   | 2997    | 701    | 23·3823                | 4·277                  |
| 41   | 70024   | 1333   | 1·9029                 | 52·549                 | 87   | 2296    | 576    | 25·1048                | 3·984                  |
| 42   | 68691   | 1358   | 1·9770                 | 50·582                 | 88   | 1720    | 465    | 27·0056                | 3·702                  |
| 43   | 67333   | 1403   | 2·0841                 | 47·985                 | 89   | 1255    | 365    | 29·0849                | 3·439                  |
| 44   | 65930   | 1466   | 2·2242                 | 44·964                 | 90   | 890     | 279    | 31·3425                | 3·191                  |
| 45   | 64464   | 1545   | 2·3973                 | 41·719                 | 91   | 611     | 206    | 33·7784                | 2·960                  |
| 46   | 62919   | 1638   | 2·6033                 | 38·417                 | 92   | 405     | 146    | 36·0226                | 2·776                  |
| 47   | 61281   | 1708   | 2·7865                 | 35·881                 | 93   | 259     | 99     | 38·0750                | 2·626                  |
| 48   | 59573   | 1756   | 2·9469                 | 33·933                 | 94   | 160     | 64     | 39·9357                | 2·504                  |
| 49   | 57817   | 1783   | 3·0843                 | 32·425                 | 95   | 96      | 40     | 41·6047                | 2·404                  |
| 50   | 56034   | 1793   | 3·1989                 | 31·260                 | 96   | 56      | 24     | 43·0820                | 2·321                  |
| 51   | 54241   | 1785   | 3·2907                 | 30·386                 | 97   | 32      | 15     | 47·3179                | 2·113                  |
| 52   | 52456   | 1788   | 3·4084                 | 29·343                 | 98   | 17      | 9      | 53·9970                | 1·852                  |
| 53   | 50668   | 1800   | 3·5523                 | 28·145                 | 99   | 8       | 5      | 61·3067                | 1·631                  |
| 54   | 48868   | 1819   | 3·7221                 | 26·867                 | 100  | 3       | 3      | 75·0000                | 1·333                  |
| 55   | 47049   | 1843   | 3·9180                 | 25·523                 |      |         |        |                        |                        |



## DURATION OF LIFE

TABLE M.—(continued.)

RURAL, TOWN, AND CITY DISTRICTS.—SCOTLAND.

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 250    | ·2499                  | 400·160                | 56   | 64211   | 1388   | 2·1615                 | 46·253                 |
| 11   | 99750   | 249    | ·2499                  | 400·160                | 57   | 62823   | 1468   | 2·3360                 | 42·808                 |
| 12   | 99501   | 265    | ·2663                  | 375·516                | 58   | 61355   | 1546   | 2·5189                 | 39·698                 |
| 13   | 99236   | 297    | ·2991                  | 334·336                | 59   | 59809   | 1621   | 2·7101                 | 36·900                 |
| 14   | 98939   | 345    | ·3484                  | 287·026                | 60   | 58188   | 1693   | 2·9096                 | 34·364                 |
| 15   | 98594   | 408    | ·4140                  | 241·546                | 61   | 56495   | 1761   | 3·1175                 | 32·072                 |
| 16   | 98186   | 487    | ·4961                  | 201·572                | 62   | 54734   | 1814   | 3·3149                 | 30·166                 |
| 17   | 97699   | 553    | ·5659                  | 176·710                | 63   | 52920   | 1853   | 3·5019                 | 28·555                 |
| 18   | 97146   | 606    | ·6234                  | 160·411                | 64   | 51067   | 1879   | 3·6786                 | 27·181                 |
| 19   | 96540   | 645    | ·6686                  | 149·566                | 65   | 49188   | 1891   | 3·8448                 | 26·008                 |
| 20   | 95895   | 673    | ·7015                  | 142·552                | 66   | 47297   | 1892   | 4·0007                 | 24·994                 |
| 21   | 95222   | 688    | ·7221                  | 138·485                | 67   | 45405   | 1909   | 4·2036                 | 23·787                 |
| 22   | 94534   | 697    | ·7377                  | 135·557                | 68   | 43496   | 1937   | 4·4538                 | 22·452                 |
| 23   | 93837   | 702    | ·7483                  | 133·636                | 69   | 41559   | 1975   | 4·7511                 | 21·048                 |
| 24   | 93135   | 702    | ·7539                  | 132·644                | 70   | 39584   | 2017   | 5·0955                 | 19·623                 |
| 25   | 92433   | 697    | ·7545                  | 132·538                | 71   | 37567   | 2061   | 5·4871                 | 18·225                 |
| 26   | 91736   | 688    | ·7502                  | 133·298                | 72   | 35506   | 2066   | 5·8183                 | 17·188                 |
| 27   | 91048   | 685    | ·7518                  | 133·014                | 73   | 33440   | 2036   | 6·0892                 | 16·423                 |
| 28   | 90363   | 686    | ·7594                  | 131·683                | 74   | 31404   | 1978   | 6·2997                 | 15·873                 |
| 29   | 89677   | 693    | ·7730                  | 129·366                | 75   | 29426   | 1898   | 6·4499                 | 15·504                 |
| 30   | 88984   | 705    | ·7926                  | 126·167                | 76   | 27528   | 1800   | 6·5397                 | 15·291                 |
| 31   | 88279   | 722    | ·8182                  | 122·220                | 77   | 25728   | 1795   | 6·9783                 | 14·331                 |
| 32   | 87557   | 742    | ·8474                  | 118·008                | 78   | 23933   | 1859   | 7·7657                 | 12·877                 |
| 33   | 86815   | 764    | ·8801                  | 113·624                | 79   | 22074   | 1965   | 8·9019                 | 11·233                 |
| 34   | 86051   | 789    | ·9164                  | 109·123                | 80   | 20109   | 2089   | 10·3868                | 9·625                  |
| 35   | 85262   | 815    | ·9562                  | 104·581                | 81   | 18020   | 2202   | 12·2205                | 8·183                  |
| 36   | 84447   | 844    | ·9996                  | 100·040                | 82   | 15818   | 2177   | 13·7630                | 7·267                  |
| 37   | 83603   | 864    | 1·0334                 | 96·805                 | 83   | 13641   | 2048   | 15·0144                | 6·662                  |
| 38   | 82739   | 875    | 1·0575                 | 94·518                 | 84   | 11593   | 1852   | 15·9747                | 6·262                  |
| 39   | 81864   | 878    | 1·0719                 | 93·284                 | 85   | 9741    | 1621   | 16·6438                | 6·010                  |
| 40   | 80986   | 872    | 1·0767                 | 92·851                 | 86   | 8120    | 1382   | 17·0217                | 5·875                  |
| 41   | 80114   | 859    | 1·0719                 | 93·284                 | 87   | 6738    | 1199   | 17·7963                | 5·618                  |
| 42   | 79255   | 861    | 1·0867                 | 91·996                 | 88   | 5539    | 1051   | 18·9674                | 5·271                  |
| 43   | 78394   | 879    | 1·1212                 | 89·206                 | 89   | 4488    | 922    | 20·5351                | 4·869                  |
| 44   | 77515   | 911    | 1·1754                 | 85·106                 | 90   | 3566    | 802    | 22·4994                | 4·444                  |
| 45   | 76604   | 957    | 1·2492                 | 80·064                 | 91   | 2764    | 687    | 24·8602                | 4·023                  |
| 46   | 75647   | 1016   | 1·3427                 | 74·460                 | 92   | 2077    | 569    | 27·4071                | 3·648                  |
| 47   | 74631   | 1062   | 1·4229                 | 70·274                 | 93   | 1508    | 455    | 30·1400                | 3·318                  |
| 48   | 73569   | 1096   | 1·4896                 | 67·114                 | 94   | 1053    | 348    | 33·0589                | 3·025                  |
| 49   | 72473   | 1118   | 1·5430                 | 64·809                 | 95   | 705     | 255    | 36·1639                | 2·765                  |
| 50   | 71355   | 1130   | 1·5830                 | 63·171                 | 96   | 450     | 178    | 39·4548                | 2·535                  |
| 51   | 70225   | 1130   | 1·6096                 | 62·112                 | 97   | 272     | 123    | 45·1416                | 2·215                  |
| 52   | 69095   | 1150   | 1·6641                 | 60·096                 | 98   | 149     | 79     | 52·9088                | 1·890                  |
| 53   | 67945   | 1187   | 1·7466                 | 57·241                 | 99   | 70      | 43     | 61·3067                | 1·631                  |
| 54   | 66758   | 1240   | 1·8569                 | 53·850                 | 100  | 27      | 27     | 75·0000                | 1·333                  |
| 55   | 65518   | 1307   | 1·9952                 | 50·125                 |      |         |        |                        |                        |



TABLE N.

## EXPECTATION.—SCOTLAND.

| Age. | Rural Districts. | Town Districts. | City Districts. | Rural, Town, & City Districts | Age. | Rural Districts. | Town Districts. | City Districts. | Rural, Town, & City Districts |
|------|------------------|-----------------|-----------------|-------------------------------|------|------------------|-----------------|-----------------|-------------------------------|
| 10   | 53.0510          | 50.7434         | 42.6373         | 50.8034                       | 56   | 18.6111          | 16.0438         | 14.8280         | 17.8953                       |
| 11   | 52.1722          | 49.8830         | 41.8048         | 49.9295                       | 57   | 17.9331          | 15.2735         | 14.4469         | 17.2797                       |
| 12   | 51.2911          | 49.0180         | 40.9694         | 49.0532                       | 58   | 17.2733          | 14.5329         | 14.0759         | 16.6812                       |
| 13   | 50.4169          | 48.1599         | 40.1335         | 48.1828                       | 59   | 16.6343          | 13.8168         | 13.7077         | 16.0994                       |
| 14   | 49.5580          | 47.3152         | 39.3002         | 47.3260                       | 60   | 16.0180          | 13.1213         | 13.3345         | 15.5340                       |
| 15   | 48.7221          | 46.4911         | 38.4725         | 46.4898                       | 61   | 15.4267          | 12.4418         | 12.9490         | 14.9845                       |
| 16   | 47.9173          | 45.6942         | 37.6533         | 45.6810                       | 62   | 14.8617          | 11.7743         | 12.5437         | 14.4506                       |
| 17   | 47.1508          | 44.9319         | 36.8444         | 44.9062                       | 63   | 14.3163          | 11.1478         | 12.1192         | 13.9288                       |
| 18   | 46.4129          | 44.1936         | 36.0570         | 44.1590                       | 64   | 13.7839          | 10.5876         | 11.6753         | 13.4160                       |
| 19   | 45.6955          | 43.4703         | 35.3008         | 43.4330                       | 65   | 13.2588          | 10.1175         | 11.2125         | 12.9094                       |
| 20   | 44.9901          | 42.7522         | 34.5860         | 42.7218                       | 66   | 12.7351          | 9.7619          | 10.7297         | 12.4056                       |
| 21   | 44.2886          | 42.0308         | 33.9211         | 42.0201                       | 67   | 12.2073          | 9.5491          | 10.2274         | 11.9017                       |
| 22   | 43.5830          | 41.2981         | 33.3154         | 41.3224                       | 68   | 11.6808          | 9.4166          | 9.7229          | 11.4021                       |
| 23   | 42.8736          | 40.5531         | 32.7492         | 40.6255                       | 69   | 11.1607          | 9.3014          | 9.2314          | 10.9102                       |
| 24   | 42.1600          | 39.7960         | 32.2036         | 39.9280                       | 70   | 10.6514          | 9.1369          | 8.7671          | 10.4296                       |
| 25   | 41.4422          | 39.0260         | 31.6603         | 39.2274                       | 71   | 10.1578          | 8.8548          | 8.3430          | 9.9627                        |
| 26   | 40.7201          | 38.2432         | 31.1018         | 38.5217                       | 72   | 9.6808           | 8.3921          | 7.9715          | 9.5118                        |
| 27   | 39.9931          | 37.4472         | 30.5107         | 37.8090                       | 73   | 9.2107           | 7.8308          | 7.6303          | 9.0688                        |
| 28   | 39.2613          | 36.6439         | 29.8970         | 37.0919                       | 74   | 8.7374           | 7.2447          | 7.2975          | 8.6243                        |
| 29   | 38.5247          | 35.8398         | 29.2690         | 36.3717                       | 75   | 8.2513           | 6.6965          | 6.9529          | 8.1705                        |
| 30   | 37.7826          | 35.0397         | 28.6354         | 35.6512                       | 76   | 7.7431           | 6.2401          | 6.5756          | 7.6993                        |
| 31   | 37.0347          | 34.2500         | 28.0042         | 34.9319                       | 77   | 7.2039           | 5.9287          | 6.1467          | 7.2030                        |
| 32   | 36.2809          | 33.4745         | 27.3824         | 34.2157                       | 78   | 6.6622           | 5.7177          | 5.6947          | 6.7057                        |
| 33   | 35.5241          | 32.7126         | 26.7700         | 33.5040                       | 79   | 6.1411           | 5.5667          | 5.2437          | 6.2284                        |
| 34   | 34.7671          | 31.9639         | 26.1653         | 32.7969                       | 80   | 5.6598           | 5.4355          | 4.8150          | 5.7882                        |
| 35   | 34.0125          | 31.2272         | 25.5674         | 32.0958                       | 81   | 5.2350           | 5.2799          | 4.4254          | 5.4012                        |
| 36   | 33.2626          | 30.5021         | 24.9755         | 31.4008                       | 82   | 4.8828           | 5.0529          | 4.0917          | 5.0835                        |
| 37   | 32.5199          | 29.7877         | 24.3893         | 30.7127                       | 83   | 4.5880           | 4.7748          | 3.8025          | 4.8149                        |
| 38   | 31.7814          | 29.0772         | 23.8069         | 30.0282                       | 84   | 4.3384           | 4.4666          | 3.5479          | 4.5772                        |
| 39   | 31.0442          | 28.3640         | 23.2267         | 29.3438                       | 85   | 4.1237           | 4.1466          | 3.3182          | 4.3524                        |
| 40   | 30.3052          | 27.6413         | 22.6474         | 28.6565                       | 86   | 3.9341           | 3.8309          | 3.1053          | 4.1214                        |
| 41   | 29.5621          | 26.9034         | 22.0675         | 27.9630                       | 87   | 3.7600           | 3.5345          | 2.9007          | 3.8642                        |
| 42   | 28.8126          | 26.1449         | 21.4860         | 27.2606                       | 88   | 3.5923           | 3.2583          | 2.7047          | 3.5925                        |
| 43   | 28.0598          | 25.3829         | 20.8624         | 26.5545                       | 89   | 3.4192           | 3.0029          | 2.5215          | 3.3166                        |
| 44   | 27.3070          | 24.6330         | 20.2436         | 25.8501                       | 90   | 3.2280           | 2.7616          | 2.3506          | 3.0449                        |
| 45   | 26.5571          | 23.9095         | 19.7948         | 25.1515                       | 91   | 3.0033           | 2.5411          | 2.1956          | 2.7833                        |
| 46   | 25.8129          | 23.2257         | 19.2686         | 24.4633                       | 92   | 2.7243           | 2.3393          | 2.0580          | 2.5385                        |
| 47   | 25.0769          | 22.5943         | 18.7703         | 23.7895                       | 93   | 2.4210           | 2.1546          | 1.9363          | 2.3077                        |
| 48   | 24.3472          | 21.9871         | 18.2941         | 23.1251                       | 94   | 2.1181           | 1.9788          | 1.8250          | 2.0888                        |
| 49   | 23.6215          | 21.3778         | 17.8345         | 22.4679                       | 95   | 1.8181           | 1.8072          | 1.7084          | 1.8730                        |
| 50   | 22.8980          | 20.7418         | 17.3861         | 21.8122                       | 96   | 1.5426           | 1.6275          | 1.5714          | 1.6511                        |
| 51   | 22.1748          | 20.0545         | 16.9443         | 21.1550                       | 97   | 1.2926           | 1.4008          | 1.3750          | 1.4044                        |
| 52   | 21.4497          | 19.2971         | 16.5039         | 20.4930                       | 98   | 1.0568           | 1.1515          | 1.1471          | 1.1510                        |
| 53   | 20.7272          | 18.4949         | 16.0687         | 19.8312                       | 99   | .8478            | .8871           | .8750           | .8857                         |
| 54   | 20.0111          | 17.6717         | 15.6421         | 19.1750                       | 100  | .5000            | .5000           | .5000           | .5000                         |
| 55   | 19.3048          | 16.8486         | 15.2275         | 18.5285                       |      |                  |                 |                 |                               |



From a consideration of these results, it will be seen that the Rural Districts of the two countries have shewn the nearest approximation; and this is precisely what might have been anticipated from a careful consideration of the elements entering into the formation of the respective Tables. In the Rural Districts of all countries, the condition of the population, as to occupation and employment, is more nearly the same than in the Town or City Districts; and since employment has been shewn to have so important an effect on the Duration of Life, the rates of mortality should differ less in the Rural Districts, where less diversity of employment exists. Before, however, fixing definitely on the Scotch Cities so high a rate of mortality as that shewn in Table M, it should be kept in view that one very important element of the investigation has not yet been touched upon. In considering the condition of the English Cities, it was shewn how an accidental combination of certain trades would produce a very different result from the fair average of the general population; so also, in the present comparison of the Scotch with the English Cities, may an excess of particular trades, not common to both Districts, or not existing in both Districts in the same ratio, modify the results. The inquiry will therefore not be complete till similar trades in both Districts be compared. To enter further, however, into that question would, as already stated, be to go beyond the limits assigned to this paper.

But as some curiosity may naturally be excited by the marked difference in the value of life, as shewn in the preceding Table, between the Scotch and English Cities, it has been thought of sufficient importance to form Mortality Tables for the general population of the City of Glasgow, in order to compare the results with English Cities.

These Tables—viz. O, P, Q, and R—have been formed exactly in the same manner as Tables A, B, C, D. It is therefore not necessary to enter further into that part of the question, than to state that the basis of the Tables are the Mortality Bills for the City of Glasgow for the ten years 1832-1841, and the population as enumerated in 1831 and 1841.

An inspection of TABLE Q will shew that of the male population of Glasgow alive at Age 10, one half is cut off between the ages 48-9, which is

20 years earlier than among Friendly Societies in the Rural Districts of England.

19 ... .. Scotland.

17 ... .. Town ...

16 ... .. England.

13 ... .. City ...

5 ... .. Scotland.

3 ... .. Clerks, which was the worst class

of results formerly arrived at.

If the nature of this paper permitted a more extended review of all the facts presented  
[many



TABLE O.

POPULATION OF GLASGOW for 1831 and 1841 ; with the Annual Rate of Increase during the intermediate period.

| Age.             | MALES.              |                     |                             | FEMALES.            |                     |                             | Age.             |
|------------------|---------------------|---------------------|-----------------------------|---------------------|---------------------|-----------------------------|------------------|
|                  | Population<br>1831. | Population<br>1841. | Annual Rate<br>of Increase. | Population<br>1831. | Population<br>1841. | Annual Rate<br>of Increase. |                  |
| Under 5          | 15422               | 17840               | 1·01467                     | 14855               | 17544               | 1·01677                     | Under 5          |
| 5 ... 10         | 13127               | 14552               | 1·01035                     | 12580               | 14837               | 1·01664                     | 5 ... 10         |
| 10 ... 15        | 10491               | 14252               | 1·03111                     | 10720               | 14541               | 1·03092                     | 10 ... 15        |
| 15 ... 20        | 8489                | 13677               | 1·04882                     | 12256               | 16931               | 1·03281                     | 15 ... 20        |
| 20 ... 30        | 15177               | 28304               | 1·06430                     | 23008               | 32778               | 1·03602                     | 20 ... 30        |
| 30 ... 40        | 12179               | 18890               | 1·04487                     | 14240               | 20706               | 1·03814                     | 30 ... 40        |
| 40 ... 50        | 8685                | 12047               | 1·03326                     | 9329                | 12804               | 1·03220                     | 40 ... 50        |
| 50 ... 60        | 5549                | 5991                | 1·00771                     | 6099                | 7034                | 1·01436                     | 50 ... 60        |
| 60 ... 70        | 3228                | 3364                | 1·00413                     | 3692                | 4462                | 1·01911                     | 60 ... 70        |
| 70 ... 80        | 1090                | 1282                | 1·01630                     | 1502                | 1720                | 1·01365                     | 70 ... 80        |
| 80 ... 90        | 260                 | 256                 | —1·00140                    | 385                 | 447                 | 1·01517                     | 80 ... 90        |
| 90 ... 100       | 26                  | 22                  | —1·01670                    | 32                  | 41                  | 1·02527                     | 90 ... 100       |
| 100 and upwards. | 1                   | 1                   | 1·00000                     | 4                   | 1                   | —1·14855                    | 100 and upwards. |
| Total .....      | 93724               | 130478              | 1·03364                     | 108702              | 143846              | 1·02641                     | Total.           |

TABLE P.

GLASGOW—Total of the Population as calculated for the 30th of June in each of the Years 1832-1841, inclusive ; with the Sum of the Deaths for the corresponding years, as given in the Mortality Bills ; and the Mortality per Cent. during the same period.

| Age.             | MALES.      |         |                        | FEMALES.    |         |                        | Age.             |
|------------------|-------------|---------|------------------------|-------------|---------|------------------------|------------------|
|                  | Population. | Deaths. | Mortality<br>per Cent. | Population. | Deaths. | Mortality<br>per Cent. |                  |
| Under 5          | 167389      | 18846   | 10·6613                | 163155      | 16304   | 9·9929                 | Under 5          |
| 5 ... 10         | 139087      | 2331    | 1·6759                 | 138056      | 2134    | 1·5457                 | 5 ... 10         |
| 10 ... 15        | 127201      | 989     | ·7775                  | 127512      | 973     | ·7630                  | 10 ... 15        |
| 15 ... 20        | 111753      | 1209    | 1·0818                 | 147340      | 1147    | ·7777                  | 15 ... 20        |
| 20 ... 30        | 218158      | 3211    | 1·4718                 | 281626      | 3292    | 1·1689                 | 20 ... 30        |
| 30 ... 40        | 156737      | 3336    | 2·1284                 | 176405      | 3228    | 1·8300                 | 30 ... 40        |
| 40 ... 50        | 104660      | 3276    | 3·1301                 | 111731      | 3001    | 2·6859                 | 40 ... 50        |
| 50 ... 60        | 57928       | 2552    | 4·4054                 | 66086       | 2628    | 3·9766                 | 50 ... 60        |
| 60 ... 70        | 33033       | 2564    | 7·7619                 | 41084       | 2651    | 6·4526                 | 60 ... 70        |
| 70 ... 80        | 11942       | 1956    | 16·3791                | 16212       | 2244    | 13·8416                | 70 ... 80        |
| 80 ... 90        | 2580        | 780     | 30·2325                | 4190        | 1012    | 24·1527                | 80 ... 90        |
| 90 ... 100       | 238         | 92      | 38·6554                | 368         | 155     | 42·1196                | 90 ... 100       |
| 100 and upwards. | 10          | 9       | 90·0000                | 19          | 15      | 78·9476                | 100 and upwards. |
| Total .....      | 1130716     | 41151   | 3·6393                 | 1273784     | 38784   | 3·0447                 | Total.           |



## DURATION OF LIFE

TABLE Q.

GLASGOW.—*Males.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 1316   | 1.3157                 | 75.988                 | 56   | 36836   | 1669   | 4.5303                 | 22.075                 |
| 11   | 98684   | 1121   | 1.1360                 | 88.028                 | 57   | 35167   | 1682   | 4.7827                 | 20.907                 |
| 12   | 97563   | 980    | 1.0047                 | 99.502                 | 58   | 33485   | 1700   | 5.0768                 | 19.697                 |
| 13   | 96583   | 890    | .9214                  | 108.531                | 59   | 31785   | 1720   | 5.4125                 | 18.474                 |
| 14   | 95693   | 848    | .8863                  | 112.829                | 60   | 30065   | 1728   | 5.7482                 | 17.397                 |
| 15   | 94845   | 853    | .8993                  | 111.198                | 61   | 28337   | 1724   | 6.0838                 | 16.437                 |
| 16   | 93992   | 902    | .9601                  | 104.156                | 62   | 26613   | 1708   | 6.4195                 | 15.576                 |
| 17   | 93090   | 948    | 1.0186                 | 98.135                 | 63   | 24905   | 1682   | 6.7551                 | 14.804                 |
| 18   | 92142   | 990    | 1.0746                 | 93.023                 | 64   | 23223   | 1647   | 7.0907                 | 14.102                 |
| 19   | 91152   | 1028   | 1.1282                 | 88.652                 | 65   | 21576   | 1625   | 7.5315                 | 13.277                 |
| 20   | 90124   | 1063   | 1.1794                 | 84.818                 | 66   | 19951   | 1612   | 8.0776                 | 12.379                 |
| 21   | 89061   | 1094   | 1.2282                 | 81.433                 | 67   | 18339   | 1601   | 8.7289                 | 11.456                 |
| 22   | 87967   | 1123   | 1.2769                 | 78.309                 | 68   | 16738   | 1588   | 9.4854                 | 10.543                 |
| 23   | 86844   | 1151   | 1.3257                 | 75.415                 | 69   | 18150   | 1568   | 10.3472                | 9.662                  |
| 24   | 85693   | 1178   | 1.3744                 | 72.780                 | 70   | 13582   | 1522   | 11.2089                | 8.921                  |
| 25   | 84515   | 1206   | 1.4265                 | 70.077                 | 71   | 12060   | 1458   | 12.0906                | 8.271                  |
| 26   | 83309   | 1235   | 1.4820                 | 67.476                 | 72   | 10602   | 1375   | 12.9723                | 7.710                  |
| 27   | 82074   | 1265   | 1.5411                 | 64.893                 | 73   | 9227    | 1280   | 13.8740                | 7.210                  |
| 28   | 80809   | 1296   | 1.6036                 | 62.344                 | 74   | 7947    | 1171   | 14.7397                | 6.784                  |
| 29   | 79513   | 1328   | 1.6695                 | 59.880                 | 75   | 6776    | 1064   | 15.7061                | 6.365                  |
| 30   | 78185   | 1357   | 1.7354                 | 57.637                 | 76   | 5712    | 957    | 16.7573                | 5.967                  |
| 31   | 76828   | 1384   | 1.8013                 | 55.525                 | 77   | 4755    | 852    | 17.9132                | 5.580                  |
| 32   | 75444   | 1409   | 1.8669                 | 53.562                 | 78   | 3903    | 748    | 19.1539                | 5.222                  |
| 33   | 74035   | 1431   | 1.9328                 | 51.733                 | 79   | 3155    | 648    | 20.5353                | 4.869                  |
| 34   | 72604   | 1451   | 1.9982                 | 50.050                 | 80   | 2507    | 550    | 21.9206                | 4.562                  |
| 35   | 71153   | 1473   | 2.0694                 | 48.333                 | 81   | 1957    | 456    | 23.3060                | 4.290                  |
| 36   | 69680   | 1496   | 2.1465                 | 46.577                 | 82   | 1501    | 371    | 24.6913                | 4.050                  |
| 37   | 68184   | 1520   | 2.2294                 | 44.863                 | 83   | 1130    | 295    | 26.0766                | 3.834                  |
| 38   | 66664   | 1545   | 2.3180                 | 43.141                 | 84   | 835     | 229    | 27.4619                | 3.642                  |
| 39   | 65119   | 1571   | 2.4128                 | 41.442                 | 85   | 606     | 174    | 28.7386                | 3.479                  |
| 40   | 63548   | 1594   | 2.5076                 | 39.872                 | 86   | 432     | 129    | 29.9067                | 3.343                  |
| 41   | 61954   | 1612   | 2.6024                 | 38.432                 | 87   | 303     | 94     | 30.9662                | 3.229                  |
| 42   | 60342   | 1628   | 2.6972                 | 37.078                 | 88   | 209     | 67     | 31.9770                | 3.127                  |
| 43   | 58714   | 1639   | 2.7919                 | 35.817                 | 89   | 142     | 47     | 32.7593                | 3.053                  |
| 44   | 57075   | 1654   | 2.8975                 | 34.507                 | 90   | 95      | 32     | 33.6016                | 2.976                  |
| 45   | 55421   | 1668   | 3.0096                 | 33.223                 | 91   | 63      | 21     | 34.4439                | 2.904                  |
| 46   | 53753   | 1682   | 3.1282                 | 31.969                 | 92   | 42      | 14     | 35.2862                | 2.834                  |
| 47   | 52071   | 1694   | 3.2535                 | 30.731                 | 93   | 28      | 10     | 36.1285                | 2.768                  |
| 48   | 50377   | 1706   | 3.3853                 | 29.542                 | 94   | 18      | 6      | 36.9708                | 2.705                  |
| 49   | 48671   | 1710   | 3.5128                 | 28.466                 | 95   | 12      | 4      | 38.6715                | 2.586                  |
| 50   | 46961   | 1710   | 3.6404                 | 27.473                 | 96   | 8       | 3      | 41.2307                | 2.425                  |
| 51   | 45251   | 1705   | 3.7679                 | 26.539                 | 97   | 5       | 2      | 44.6483                | 2.240                  |
| 52   | 43546   | 1696   | 4.8954                 | 25.674                 | 98   | 3       | 1      | 48.9244                | 2.044                  |
| 53   | 41850   | 1684   | 4.0229                 | 24.857                 | 99   | 2       | 1      | 54.0589                | 1.850                  |
| 54   | 40166   | 1667   | 4.1504                 | 24.096                 | 100  | 1       | 1      | 59.1934                | 1.689                  |
| 55   | 38499   | 1663   | 4.3195                 | 23.148                 |      |         |        |                        |                        |



TABLE Q.—(continued.)

GLASGOW.—*Females.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 1433   | 1.4327                 | 69.784                 | 56   | 42123   | 1705   | 4.0478                 | 24.704                 |
| 11   | 98567   | 1258   | 1.2761                 | 78.370                 | 57   | 40418   | 1717   | 4.2479                 | 23.540                 |
| 12   | 97309   | 1121   | 1.1515                 | 86.806                 | 58   | 38701   | 1731   | 4.4718                 | 22.361                 |
| 13   | 96188   | 1018   | 1.0588                 | 94.429                 | 59   | 36970   | 1745   | 4.7194                 | 21.191                 |
| 14   | 95170   | 950    | .9979                  | 100.210                | 60   | 35225   | 1750   | 4.9670                 | 20.133                 |
| 15   | 94220   | 724    | .7687                  | 130.090                | 61   | 33475   | 1746   | 5.2146                 | 19.175                 |
| 16   | 93496   | 722    | .7717                  | 129.584                | 62   | 31729   | 1733   | 5.4622                 | 18.308                 |
| 17   | 92774   | 727    | .7838                  | 127.584                | 63   | 29996   | 1713   | 5.7098                 | 17.513                 |
| 18   | 92047   | 741    | .8051                  | 124.208                | 64   | 28283   | 1685   | 5.9574                 | 16.787                 |
| 19   | 91306   | 763    | .8356                  | 119.675                | 65   | 26598   | 1677   | 6.3033                 | 15.865                 |
| 20   | 90543   | 793    | .8755                  | 114.220                | 66   | 24921   | 1682   | 6.7474                 | 14.821                 |
| 21   | 89750   | 830    | .9244                  | 108.178                | 67   | 23239   | 1694   | 7.2898                 | 13.717                 |
| 22   | 88920   | 865    | .9733                  | 102.743                | 68   | 21545   | 1704   | 7.9104                 | 12.642                 |
| 23   | 88055   | 900    | 1.0222                 | 97.847                 | 69   | 19841   | 1716   | 8.6493                 | 11.562                 |
| 24   | 87155   | 934    | 1.0711                 | 93.371                 | 70   | 18125   | 1702   | 9.3882                 | 10.652                 |
| 25   | 86221   | 969    | 1.1235                 | 88.968                 | 71   | 16423   | 1663   | 10.1271                | 9.872                  |
| 26   | 85252   | 1005   | 1.1793                 | 84.818                 | 72   | 14760   | 1604   | 10.8660                | 9.200                  |
| 27   | 84247   | 1043   | 1.2385                 | 80.710                 | 73   | 13156   | 1529   | 11.6249                | 8.606                  |
| 28   | 83204   | 1083   | 1.3012                 | 76.864                 | 74   | 11627   | 1438   | 12.3638                | 8.091                  |
| 29   | 82121   | 1123   | 1.3673                 | 73.153                 | 75   | 10189   | 1341   | 13.1612                | 7.599                  |
| 30   | 80998   | 1161   | 1.4334                 | 69.784                 | 76   | 8848    | 1240   | 14.0170                | 7.133                  |
| 31   | 79837   | 1197   | 1.4995                 | 66.667                 | 77   | 7608    | 1136   | 14.9312                | 6.698                  |
| 32   | 78640   | 1231   | 1.5654                 | 63.898                 | 78   | 6472    | 1029   | 15.9039                | 6.289                  |
| 33   | 77409   | 1263   | 1.6315                 | 61.275                 | 79   | 5443    | 922    | 16.9350                | 5.907                  |
| 34   | 76146   | 1293   | 1.6976                 | 58.893                 | 80   | 4521    | 812    | 17.9661                | 5.565                  |
| 35   | 74853   | 1323   | 1.7676                 | 56.561                 | 81   | 3709    | 705    | 18.9972                | 5.263                  |
| 36   | 73530   | 1354   | 1.8415                 | 54.289                 | 82   | 3004    | 602    | 20.0283                | 4.993                  |
| 37   | 72176   | 1386   | 1.9195                 | 52.083                 | 83   | 2402    | 506    | 21.0594                | 4.748                  |
| 38   | 70790   | 1417   | 2.0012                 | 49.975                 | 84   | 1896    | 419    | 22.0905                | 4.527                  |
| 39   | 69373   | 1448   | 2.0868                 | 47.916                 | 85   | 1477    | 344    | 23.2747                | 4.297                  |
| 40   | 67925   | 1476   | 2.1724                 | 46.041                 | 86   | 1133    | 279    | 24.6121                | 4.063                  |
| 41   | 66449   | 1500   | 2.2580                 | 44.287                 | 87   | 854     | 223    | 26.1025                | 3.831                  |
| 42   | 64949   | 1522   | 2.3436                 | 42.662                 | 88   | 631     | 175    | 27.7461                | 3.604                  |
| 43   | 63427   | 1541   | 2.4292                 | 41.169                 | 89   | 456     | 135    | 29.5428                | 3.385                  |
| 44   | 61886   | 1556   | 2.5148                 | 39.761                 | 90   | 321     | 101    | 31.3395                | 3.191                  |
| 45   | 60330   | 1574   | 2.6091                 | 38.329                 | 91   | 220     | 73     | 33.1362                | 3.018                  |
| 46   | 58756   | 1594   | 2.7120                 | 36.873                 | 92   | 147     | 51     | 34.9329                | 2.863                  |
| 47   | 57162   | 1614   | 2.8237                 | 35.411                 | 93   | 96      | 35     | 36.7296                | 2.723                  |
| 48   | 55548   | 1635   | 2.9441                 | 33.967                 | 94   | 61      | 24     | 38.5263                | 2.595                  |
| 49   | 53913   | 1657   | 3.0732                 | 32.541                 | 95   | 37      | 15     | 40.7002                | 2.457                  |
| 50   | 52256   | 1673   | 3.2023                 | 31.230                 | 96   | 22      | 9      | 43.2513                | 2.312                  |
| 51   | 50583   | 1685   | 3.3314                 | 30.021                 | 97   | 13      | 6      | 46.1796                | 2.165                  |
| 52   | 48898   | 1692   | 3.4605                 | 28.893                 | 98   | 7       | 4      | 49.4852                | 2.020                  |
| 53   | 47206   | 1695   | 3.5895                 | 27.855                 | 99   | 3       | 2      | 53.1680                | 1.881                  |
| 54   | 45511   | 1692   | 3.7186                 | 26.889                 | 100  | 1       | 1      | 56.8508                | 1.759                  |
| 55   | 43819   | 1696   | 3.8709                 | 25.833                 |      |         |        |                        |                        |



many remarkable coincidences would be seen to have taken place, and one among these must be already obvious. The general results for Friendly Societies in England and Wales were found to be more favourable to life than the results for the whole population of England and Wales, and that in both sexes; so, also, were the results for the Members of Friendly Societies in Liverpool more favourable than those for the whole population of Liverpool; and here it will likewise be seen that the mortality of the general population of Glasgow is greater than among the Members of Friendly Societies in the City Districts of Scotland.

The difference between the Equation for Age 10 in Male and Female Life for the whole population of Glasgow is 3·125 years, while in the general population of England and Wales it is a little above one year. This suggests the mention of another feature which presents itself in this enquiry. It appears that the higher the absolute value of Life in any class of results, the less distinction will there be found between Male and Female Life. Thus—

|                              |   |                                                   |                  |                         |
|------------------------------|---|---------------------------------------------------|------------------|-------------------------|
| Equation of Life for Age 10. | { | Friendly Societies in England and Wales . . . . . | Females = 56·749 |                         |
|                              |   |                                                   | Males = 56·408   | —diff. = ·341 of a year |
|                              | { | Total Population of England and Wales . . . . .   | Females = 53·554 |                         |
|                              |   |                                                   | Males = 52·308   | —diff. = 1·249 ...      |
|                              | { | Whole Population of Glasgow . . . . .             | Females = 41·346 |                         |
|                              |   |                                                   | Males = 38·221   | —diff. = 3·125 ...      |

If comparisons were made between the sexes in the intermediate classes of results, a development of the same feature would be seen. As has already been stated, where the Duration of Life is reduced below its average standard by the prevalence of unhealthy occupations, the influence will be more strongly felt in the male than in the female sex.

If the expectation of Life for the City of Glasgow, as given in TABLE R, be now referred to, the remarkable depreciation in the duration of life there will appear somewhat startling. No Table of Mortality hitherto published has shewn any thing like so low an estimate. Liverpool has been frequently referred to as an example of the short Duration of Life; but a comparison of the Expectation of Male Life for Liverpool, as given at page 59, with the results in Table R, will shew

|                                         |     |       |
|-----------------------------------------|-----|-------|
| At Age 30 a higher value by 3·101 years |     |       |
| 40                                      | ... | 2·548 |
| 50                                      | ... | 1·535 |

[The mortality



TABLE R.

## EXPECTATION.

| Age. | Glasgow, whole Population. |          | Dundee, whole Population. |          | Age. | Glasgow, whole Population. |          | Dundee, whole Population. |          |
|------|----------------------------|----------|---------------------------|----------|------|----------------------------|----------|---------------------------|----------|
|      | Males.                     | Females. | Males.                    | Females. |      | Males.                     | Females. | Males.                    | Females. |
| 10   | 37.3954                    | 39.9471  | 43.2973                   | 45.8731  | 56   | 11.7116                    | 12.9541  | 13.8635                   | 15.1653  |
| 11   | 36.8874                    | 39.4286  | 42.6385                   | 45.2353  | 57   | 11.2426                    | 12.4794  | 13.3322                   | 14.6185  |
| 12   | 36.4055                    | 38.9319  | 41.9362                   | 44.5587  | 58   | 10.7822                    | 12.0109  | 12.8117                   | 14.0791  |
| 13   | 35.6688                    | 38.3797  | 41.2102                   | 43.8632  | 59   | 10.3322                    | 11.5499  | 12.3050                   | 13.5480  |
| 14   | 34.9959                    | 37.7849  | 40.4621                   | 43.1501  | 60   | 9.8946                     | 11.0973  | 11.8155                   | 13.0262  |
| 15   | 34.3043                    | 37.1609  | 39.7027                   | 42.4173  | 61   | 9.4675                     | 10.6513  | 11.3407                   | 12.5117  |
| 16   | 33.6111                    | 36.4448  | 38.9405                   | 41.6723  | 62   | 9.0485                     | 10.2099  | 10.8784                   | 12.0027  |
| 17   | 32.9317                    | 35.7245  | 38.1824                   | 40.9205  | 63   | 8.6347                     | 9.7709   | 10.4266                   | 11.4975  |
| 18   | 32.2656                    | 35.0027  | 37.4327                   | 40.1647  | 64   | 8.2239                     | 9.3324   | 9.9832                    | 10.9941  |
| 19   | 31.6106                    | 34.2827  | 36.6930                   | 39.4058  | 65   | 7.8135                     | 8.8919   | 9.5459                    | 10.4907  |
| 20   | 30.9655                    | 33.5674  | 35.9632                   | 38.6541  | 66   | 7.4092                     | 8.4564   | 9.1174                    | 9.9934   |
| 21   | 30.3291                    | 32.8596  | 35.2426                   | 37.9096  | 67   | 7.0165                     | 8.0322   | 8.6999                    | 9.5083   |
| 22   | 29.7000                    | 32.1616  | 34.5307                   | 37.1716  | 68   | 6.6398                     | 7.6248   | 8.2956                    | 9.0400   |
| 23   | 29.0776                    | 31.4726  | 33.8269                   | 36.4398  | 69   | 6.2834                     | 7.2367   | 7.9057                    | 8.5932   |
| 24   | 28.4615                    | 30.7228  | 33.1311                   | 35.7138  | 70   | 5.9510                     | 6.8745   | 7.5320                    | 8.1719   |
| 25   | 27.8512                    | 30.1206  | 32.4423                   | 34.9934  | 71   | 5.6390                     | 6.5351   | 7.1718                    | 7.7724   |
| 26   | 27.2472                    | 29.4573  | 31.7601                   | 34.2779  | 72   | 5.3457                     | 6.2150   | 6.8216                    | 7.3916   |
| 27   | 26.6496                    | 28.8027  | 31.0839                   | 33.5677  | 73   | 5.0678                     | 5.9118   | 6.4787                    | 7.0261   |
| 28   | 26.0590                    | 28.1575  | 30.8133                   | 32.8626  | 74   | 4.8035                     | 5.6235   | 6.1524                    | 6.6730   |
| 29   | 25.4756                    | 27.5223  | 29.7478                   | 32.1624  | 75   | 4.5472                     | 5.3466   | 5.8006                    | 6.3288   |
| 30   | 24.8998                    | 26.8970  | 29.0866                   | 31.4666  | 76   | 4.3011                     | 5.0812   | 5.4679                    | 5.9961   |
| 31   | 24.3308                    | 26.2808  | 28.4291                   | 30.7754  | 77   | 4.0661                     | 4.8278   | 5.1470                    | 5.6777   |
| 32   | 23.7679                    | 25.6732  | 27.7754                   | 30.0879  | 78   | 3.8446                     | 4.5875   | 4.8427                    | 5.3757   |
| 33   | 23.2108                    | 25.0735  | 27.1245                   | 29.4037  | 79   | 3.6376                     | 4.3602   | 4.5591                    | 5.0924   |
| 34   | 22.6584                    | 24.4811  | 26.4761                   | 28.7225  | 80   | 3.4485                     | 4.1474   | 4.3012                    | 4.8305   |
| 35   | 22.1102                    | 23.8953  | 25.8297                   | 28.0439  | 81   | 3.2772                     | 3.9457   | 4.0706                    | 4.5872   |
| 36   | 21.5670                    | 23.3163  | 25.1877                   | 27.3688  | 82   | 3.1209                     | 3.7547   | 3.8569                    | 4.3604   |
| 37   | 21.0293                    | 22.7443  | 24.5520                   | 26.6987  | 83   | 2.9814                     | 3.5703   | 3.6629                    | 4.1473   |
| 38   | 20.4974                    | 22.1798  | 23.9248                   | 26.0344  | 84   | 2.8581                     | 3.3898   | 3.4867                    | 3.9456   |
| 39   | 19.9718                    | 21.6227  | 23.3075                   | 25.3768  | 85   | 2.7491                     | 3.2096   | 3.3272                    | 3.7536   |
| 40   | 19.4532                    | 21.0730  | 22.7017                   | 24.7270  | 86   | 2.6551                     | 3.0322   | 3.1813                    | 3.5712   |
| 41   | 18.9409                    | 20.5300  | 22.1068                   | 24.0840  | 87   | 2.5726                     | 2.8595   | 3.0488                    | 3.3975   |
| 42   | 18.4335                    | 19.9925  | 21.5218                   | 23.4473  | 88   | 2.5047                     | 2.6933   | 2.9260                    | 3.2323   |
| 43   | 17.9307                    | 19.4603  | 20.9457                   | 22.8162  | 89   | 2.4507                     | 2.5351   | 2.8109                    | 3.0758   |
| 44   | 17.4313                    | 18.9324  | 20.3775                   | 22.1896  | 90   | 2.4158                     | 2.3910   | 2.7034                    | 2.9282   |
| 45   | 16.9366                    | 18.4079  | 19.8168                   | 21.5671  | 91   | 2.3889                     | 2.2591   | 2.5997                    | 2.7854   |
| 46   | 16.4466                    | 17.8875  | 19.2620                   | 20.9498  | 92   | 2.3333                     | 2.1327   | 2.5075                    | 2.6492   |
| 47   | 15.9618                    | 17.3724  | 18.7129                   | 20.3391  | 93   | 2.2500                     | 2.0000   | 2.4022                    | 2.5119   |
| 48   | 15.4817                    | 16.8626  | 18.1679                   | 19.7356  | 94   | 2.2223                     | 1.8606   | 2.3000                    | 2.3712   |
| 49   | 15.0061                    | 16.3589  | 17.6266                   | 19.2264  | 95   | 2.0761                     | 1.7432   | 2.1786                    | 2.2192   |
| 50   | 14.5350                    | 15.8617  | 17.0891                   | 18.5541  | 96   | 1.8750                     | 1.5909   | 2.0179                    | 2.0474   |
| 51   | 14.0654                    | 15.3698  | 16.5521                   | 17.9757  | 97   | 1.7000                     | 1.3461   | 1.7973                    | 1.8297   |
| 52   | 13.5965                    | 14.8822  | 16.0160                   | 17.4041  | 98   | 1.5000                     | 1.0714   | 1.5000                    | 1.5508   |
| 53   | 13.1273                    | 14.3977  | 15.4795                   | 16.8381  | 99   | 1.0000                     | .8333    | 1.0000                    | 1.1315   |
| 54   | 12.6567                    | 13.9153  | 14.9417                   | 16.2766  | 100  | .5000                      | .5000    | .5000                     | .5000    |
| 55   | 12.1831                    | 13.4333  | 14.4014                   | 15.7186  |      |                            |          |                           |          |



The mortality of a population like that of Glasgow is subject to remarkable fluctuations, shewing an extreme difference in some years of about 68 per cent., or a mean fluctuation of about 32 per cent. An inspection of the total male deaths for all ages, for each of the ten years 1832—1842, will render this evident.

|                      |   |   |      |                      |   |   |      |
|----------------------|---|---|------|----------------------|---|---|------|
| Total Deaths in 1832 | . | . | 4811 | Total Deaths in 1837 | . | . | 5423 |
| ... 1833             | . | . | 3229 | ... 1838             | . | . | 3490 |
| ... 1834             | . | . | 3255 | ... 1839             | . | . | 3898 |
| ... 1835             | . | . | 3726 | ... 1840             | . | . | 4470 |
| ... 1836             | . | . | 4334 | ... 1841             | . | . | 4514 |

It will further be seen that those remarkable fluctuations are due chiefly to the mortality in mature life, and not to the mortality in infancy, as some writers have believed.

| Year.   |   | From Age 20<br>to 50. |   | In the First<br>Year of Life. | Year.   |   | From Age 20<br>to 50. |   | In the First<br>Year of Life. |
|---------|---|-----------------------|---|-------------------------------|---------|---|-----------------------|---|-------------------------------|
| In 1832 | . | 1795                  | . | 332                           | In 1837 | . | 1991                  | . | 371                           |
| 1833    | . | 902                   | . | 306                           | 1838    | . | 1010                  | . | 336                           |
| 1834    | . | 923                   | . | 313                           | 1839    | . | 966                   | . | 318                           |
| 1835    | . | 885                   | . | 365                           | 1840    | . | 1346                  | . | 404                           |
| 1836    | . | 1279                  | . | 115                           | 1841    | . | 1278                  | . | 381                           |

The preceding will shew, that while the extreme difference in the mortality from ages 20 to 50 is 125 per cent., for the first year of life it is only 32 per cent. If the mean fluctuation for ages 20 to 50 be taken, it will be found to be 53 per cent., while that for the first year of life is only 14 per cent. Were the inspection extended to the mortality of female life, similar results would be obtained. Notwithstanding the inferior numbers in infant life, the fluctuation is confined within narrower limits than the mortality of mature life; and this law is in obedience to the doctrine of probability, when applied to any other subject, as well as to the mortality of life. For whenever the intensity which determines any result increases—or in other words, when the probability of any event approaches unity—so also will the fluctuation in a series of events be reduced in amount.

It is evident from the preceding results of the Mortality in Glasgow, that a Table of the Expectation of Life calculated for one period of years—for example, the three years 1833, 1834, 1835—would differ widely from a Table founded on the results of the succeeding period of three years, and that the next succeeding period of three years would also differ in a marked degree from either of these: it has on that account been thought the better course to embrace the results of the whole ten years. On a previous occasion, a Table of the Expectation of Life for the five years, 1836—1840, had been calculated; and the results were for ages

$$20 = 27.624$$

$$40 = 21.711$$

$$50 = 16.590$$

bringing the Expectation of Life above that given for the whole population of Liverpool,



in the Fifth Report of the Registrar General. It would therefore be rash to conclude that the public health of Glasgow is inferior to that of Liverpool; for if the same means existed of calculating the mortality of Liverpool during the ten years to which the results for Glasgow relate, it might then be found that the Expectation of Life, on an average of that number of years, was overstated by the Registrar General, whose figures were derived from the mortality of one year only.

In the Tenth Report of the Registrar General he has given the mortality of Liverpool for the seven years 1838-44, and the results will be found to fully bear out the views originally entertained in the preparation of this paper, as is evident from the facts contained in the following abstract, shewing the mortality per cent. in Liverpool, deduced from the Deaths for 1841, and also from the Deaths for the seven years 1838-44.

| Age.      | MORTALITY PER CENT. |          | Age.      |
|-----------|---------------------|----------|-----------|
|           | MALES.              |          |           |
|           | 1841.               | 1838-44. |           |
| 10 to 14  | ·654                | ·631     | 10 to 14  |
| 15 ... 24 | ·935                | ·987     | 15 ... 24 |
| 25 ... 34 | 1·239               | 1·268    | 25 ... 34 |
| 35 ... 44 | 2·215               | 2·162    | 35 ... 44 |
| 45 ... 54 | 3·261               | 3·367    | 45 ... 54 |
| 55 ... 64 | 5·298               | 5·305    | 55 ... 64 |
| 65 ... 74 | 9·644               | 10·634   | 65 ... 74 |
| 75 ... 84 | 17·422              | 20·740   | 75 ... 84 |
| 85 ... 94 | 19·713              | 32·230   | 85 ... 94 |

It is hence very desirable that our national records should be immediately made available to every inquirer into Vital Statistics, that the incorrect conclusions heretofore so generally drawn from limited observations, even under official sanction, may be supplanted by others founded on an enlarged and more carefully collected body of facts.

An inspection of TABLE R will shew that Female Life in Glasgow, as elsewhere, is of higher value than Male Life.

|                               | At Age 30. | At Age 40. | At Age 50. |
|-------------------------------|------------|------------|------------|
| The Expectation of Females is | 26·8970    | 21·0730    | 15·8617    |
| And of Males                  | 24·8998    | 19·4532    | 14·5350    |
| Difference                    | 1·9972     | 1·6198     | 1·3267     |



TABLE S.

DUNDEE.—Total of the Populations as calculated for the 30th of June in each of the Years 1835–44 inclusive; with the sum of the Deaths for the Corresponding Years as given in the Mortality Bills, and the Mortality per Cent. during the same period.

| Age.             | MALES.      |                                |            | FEMALES.    |                                |            | Age.             |
|------------------|-------------|--------------------------------|------------|-------------|--------------------------------|------------|------------------|
|                  | Population. | Deaths exclusive of Stillborn. | Mortality. | Population. | Deaths exclusive of Stillborn. | Mortality. |                  |
| Under 5          | 41450       | 3328                           | 8.0289     | 41513       | 3042                           | 7.3302     | Under 5          |
| 5 ... 10         | 34005       | 413                            | 1.2145     | 32622       | 410                            | 1.2568     | 5 ... 10         |
| 10 ... 20        | 60931       | 377                            | .6187      | 67367       | 366                            | .5432      | 10 ... 20        |
| 20 ... 30        | 46877       | 481                            | 1.0260     | 67086       | 569                            | .8481      | 20 ... 30        |
| 30 ... 40        | 39488       | 562                            | 1.4232     | 46323       | 553                            | 1.1950     | 30 ... 40        |
| 40 ... 50        | 24931       | 585                            | 2.3464     | 31782       | 585                            | 1.8406     | 40 ... 50        |
| 50 ... 60        | 14826       | 485                            | 3.2712     | 18089       | 533                            | 2.9465     | 50 ... 60        |
| 60 ... 70        | 8537        | 528                            | 6.1848     | 12888       | 633                            | 4.9116     | 60 ... 70        |
| 70 ... 80        | 4113        | 476                            | 11.5730    | 5128        | 552                            | 10.7644    | 70 ... 80        |
| 80 ... 90        | 831         | 204                            | 24.5500    | 1197        | 252                            | 21.0526    | 80 ... 90        |
| 90 ... 100       | 67          | 13                             | 19.4030    | 155         | 34                             | 21.9289    | 90 ... 100       |
| 100 and upwards. | 0           | 2                              | 0          | 19          | 2                              | 10.5263    | 100 and upwards. |
|                  | 276056      | 7454                           | 2.7000     | 324129      | 7531                           | 2.3234     |                  |

The preceding results seem to point out a higher rate of mortality as pervading all the groups of observations brought into comparison from Scotland; and it is therefore to be regretted that the Registration Act does not extend to that country, and afford a certain means of solving so important a question. The subject, however, in its present state, has been thought of sufficient importance to warrant the calculation of Mortality Tables for the Town of Dundee; and accordingly TABLES S and T have been deduced from the Mortality Bills of that Town for the ten years 1835–44, and the Census of the Population in 1841, on the principles described for the formation of Tables B and C. The Expectation of Life, as resulting from these Tables, will be found in Table R.

An inspection of TABLE T will shew that in Dundee the Equation of Male Life for Age 10 takes place at Age 55–6, which is seven years beyond the results obtained in Table Q for the whole population of Glasgow, and even two years higher than the [Equation of



TABLE T.

TRADES NOT CLASSIFIED—DUNDEE—*Males*.

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 791    | ·7910                  | 126·422                | 56   | 49251   | 1669   | 3·3905                 | 29·490                 |
| 11   | 99209   | 696    | ·7020                  | 142·450                | 57   | 47582   | 1714   | 3·6023                 | 27·762                 |
| 12   | 98513   | 647    | ·6568                  | 152·253                | 58   | 45868   | 1767   | 3·8538                 | 25·947                 |
| 13   | 97866   | 602    | ·6148                  | 162·655                | 59   | 44101   | 1828   | 4·1451                 | 24·125                 |
| 14   | 97264   | 582    | ·5981                  | 167·196                | 60   | 42273   | 1875   | 4·4365                 | 22·538                 |
| 15   | 96682   | 583    | ·6034                  | 165·728                | 61   | 40398   | 1909   | 4·7278                 | 21·151                 |
| 16   | 96099   | 601    | ·6259                  | 159·770                | 62   | 38489   | 1931   | 5·0192                 | 19·924                 |
| 17   | 95498   | 630    | ·6601                  | 151·492                | 63   | 36558   | 1941   | 5·3106                 | 18·829                 |
| 18   | 94868   | 664    | ·7003                  | 142·796                | 64   | 34617   | 1939   | 5·6020                 | 17·851                 |
| 19   | 94204   | 698    | ·7410                  | 134·953                | 65   | 32678   | 1942   | 5·9429                 | 16·827                 |
| 20   | 93506   | 731    | ·7818                  | 127·910                | 66   | 30736   | 1946   | 6·3332                 | 15·790                 |
| 21   | 92775   | 763    | ·8225                  | 121·581                | 67   | 28790   | 1950   | 6·7731                 | 14·765                 |
| 22   | 92012   | 794    | ·8632                  | 115·848                | 68   | 26840   | 1948   | 7·2604                 | 13·774                 |
| 23   | 91218   | 825    | ·9039                  | 110·632                | 69   | 24892   | 1941   | 7·8012                 | 12·819                 |
| 24   | 90393   | 854    | ·9446                  | 105·865                | 70   | 22951   | 1914   | 8·3400                 | 11·990                 |
| 25   | 89539   | 882    | ·9851                  | 101·513                | 71   | 21037   | 1867   | 8·8788                 | 11·263                 |
| 26   | 88657   | 909    | 1·0255                 | 97·466                 | 72   | 19170   | 1805   | 9·4176                 | 10·618                 |
| 27   | 87748   | 935    | 1·0656                 | 93·809                 | 73   | 17365   | 1728   | 9·9564                 | 10·044                 |
| 28   | 86813   | 960    | 1·1055                 | 90·416                 | 74   | 15637   | 1641   | 10·4953                | 9·524                  |
| 29   | 85853   | 983    | 1·1453                 | 87·336                 | 75   | 13996   | 1565   | 11·1859                | 8·937                  |
| 30   | 84870   | 1005   | 1·1850                 | 84·388                 | 76   | 12431   | 1495   | 12·0283                | 8·313                  |
| 31   | 83865   | 1027   | 1·2247                 | 81·633                 | 77   | 10936   | 1424   | 13·0225                | 7·680                  |
| 32   | 82838   | 1047   | 1·2644                 | 79·114                 | 78   | 9512    | 1347   | 14·1684                | 7·057                  |
| 33   | 81791   | 1066   | 1·3041                 | 76·687                 | 79   | 8165    | 1262   | 15·4661                | 6·464                  |
| 34   | 80725   | 1084   | 1·3438                 | 74·405                 | 80   | 6903    | 1162   | 16·7638                | 5·967                  |
| 35   | 79641   | 1110   | 1·3940                 | 71·736                 | 81   | 5741    | 1036   | 18·0615                | 5·537                  |
| 36   | 78531   | 1142   | 1·4548                 | 68·729                 | 82   | 4705    | 911    | 19·3592                | 5·165                  |
| 37   | 77389   | 1181   | 1·5261                 | 65·531                 | 83   | 3794    | 784    | 20·6569                | 4·840                  |
| 38   | 76208   | 1225   | 1·6080                 | 62·189                 | 84   | 3010    | 661    | 21·9546                | 4·556                  |
| 39   | 74983   | 1274   | 1·7003                 | 58·824                 | 85   | 2349    | 545    | 23·2132                | 4·308                  |
| 40   | 73709   | 1321   | 1·7927                 | 55·772                 | 86   | 1804    | 441    | 24·4327                | 4·093                  |
| 41   | 72388   | 1364   | 1·8850                 | 53·050                 | 87   | 1363    | 349    | 25·6131                | 3·905                  |
| 42   | 71024   | 1404   | 1·9774                 | 50·582                 | 88   | 1014    | 271    | 26·7544                | 3·738                  |
| 43   | 69620   | 1440   | 2·0697                 | 48·309                 | 89   | 743     | 207    | 27·8566                | 3·589                  |
| 44   | 68180   | 1474   | 2·1619                 | 46·253                 | 90   | 536     | 155    | 28·9588                | 3·453                  |
| 45   | 66706   | 1503   | 2·2542                 | 44·366                 | 91   | 381     | 115    | 30·0610                | 3·327                  |
| 46   | 65203   | 1530   | 2·3465                 | 43·608                 | 92   | 266     | 82     | 31·1632                | 3·209                  |
| 47   | 63673   | 1552   | 2·4388                 | 41·000                 | 93   | 184     | 59     | 32·2654                | 3·099                  |
| 48   | 62121   | 1572   | 2·5313                 | 39·510                 | 94   | 125     | 41     | 33·3676                | 2·997                  |
| 49   | 60549   | 1592   | 2·6237                 | 38·110                 | 95   | 84      | 28     | 34·4638                | 2·902                  |
| 50   | 58957   | 1601   | 2·7162                 | 36·819                 | 96   | 56      | 19     | 35·5071                | 2·816                  |
| 51   | 57356   | 1611   | 2·8087                 | 35·600                 | 97   | 37      | 13     | 36·4348                | 2·745                  |
| 52   | 55745   | 1617   | 2·9012                 | 34·471                 | 98   | 24      | 8      | 37·2708                | 2·683                  |
| 53   | 54128   | 1620   | 2·9937                 | 33·400                 | 99   | 16      | 8      | 38·0060                | 2·631                  |
| 54   | 52508   | 1620   | 3·0860                 | 32·404                 | 100  | 8       | 8      | 38·6500                | 2·587                  |
| 55   | 50888   | 1637   | 3·2184                 | 31·075                 |      |         |        |                        |                        |



## DURATION OF LIFE

TABLE T.—(continued.)

DUNDEE.—*Females.*

| Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. | Age. | Living. | Dying. | Mortality<br>per Cent. | Specific<br>Intensity. |
|------|---------|--------|------------------------|------------------------|------|---------|--------|------------------------|------------------------|
| 10   | 100000  | 792    | ·7920                  | 126·263                | 56   | 54982   | 1648   | 2·9980                 | 33·356                 |
| 11   | 99208   | 712    | ·7180                  | 139·276                | 57   | 53334   | 1685   | 3·1602                 | 31·646                 |
| 12   | 98496   | 676    | ·6864                  | 145·688                | 58   | 51649   | 1724   | 3·3395                 | 29·940                 |
| 13   | 97820   | 643    | ·6578                  | 152·022                | 59   | 49925   | 1765   | 3·5360                 | 28·281                 |
| 14   | 97177   | 605    | ·6228                  | 160·565                | 60   | 48160   | 1797   | 3·7325                 | 26·788                 |
| 15   | 96572   | 584    | ·6050                  | 165·289                | 61   | 46363   | 1821   | 3·9290                 | 25·452                 |
| 16   | 95988   | 575    | ·5994                  | 166·834                | 62   | 44542   | 1837   | 4·1255                 | 24·237                 |
| 17   | 95413   | 573    | ·6010                  | 166·389                | 63   | 42705   | 1845   | 4·3220                 | 23·137                 |
| 18   | 94840   | 573    | ·6042                  | 165·508                | 64   | 40860   | 1846   | 4·5185                 | 22·129                 |
| 19   | 94267   | 598    | ·6347                  | 157·555                | 65   | 39014   | 1869   | 4·7928                 | 20·864                 |
| 20   | 93669   | 623    | ·6652                  | 150·331                | 66   | 37145   | 1911   | 5·1446                 | 19·436                 |
| 21   | 93046   | 647    | ·6957                  | 143·740                | 67   | 35234   | 1964   | 5·5763                 | 17·934                 |
| 22   | 92399   | 671    | ·7262                  | 137·703                | 68   | 33270   | 2024   | 6·0859                 | 16·431                 |
| 23   | 91728   | 694    | ·7567                  | 132·153                | 69   | 31246   | 2085   | 6·6731                 | 14·986                 |
| 24   | 91034   | 717    | ·7872                  | 127·033                | 70   | 29161   | 2117   | 7·2604                 | 13·774                 |
| 25   | 90317   | 739    | ·8185                  | 122·175                | 71   | 27044   | 2122   | 7·8479                 | 12·742                 |
| 26   | 89578   | 762    | ·8506                  | 117·564                | 72   | 24922   | 2101   | 8·4332                 | 11·858                 |
| 27   | 88816   | 785    | ·8836                  | 113·173                | 73   | 22821   | 2058   | 9·0205                 | 11·085                 |
| 28   | 88031   | 808    | ·9174                  | 109·004                | 74   | 20763   | 1994   | 9·6038                 | 10·412                 |
| 29   | 87223   | 830    | ·9521                  | 105·031                | 75   | 18769   | 1928   | 10·2758                | 9·728                  |
| 30   | 86393   | 853    | ·9868                  | 101·338                | 76   | 16841   | 1858   | 11·0365                | 9·058                  |
| 31   | 85540   | 874    | 1·0215                 | 97·847                 | 77   | 14983   | 1780   | 11·8859                | 8·410                  |
| 32   | 84666   | 894    | 1·0562                 | 94·697                 | 78   | 13203   | 1692   | 12·8220                | 7·800                  |
| 33   | 83772   | 914    | 1·0909                 | 91·659                 | 79   | 11511   | 1594   | 13·8508                | 7·220                  |
| 34   | 82858   | 933    | 1·1256                 | 88·810                 | 80   | 9917    | 1475   | 14·8796                | 6·720                  |
| 35   | 81925   | 955    | 1·1663                 | 85·763                 | 81   | 8442    | 1343   | 15·9084                | 6·285                  |
| 36   | 80970   | 982    | 1·2129                 | 82·440                 | 82   | 7099    | 1202   | 16·9372                | 5·903                  |
| 37   | 75988   | 1012   | 1·2655                 | 78·989                 | 83   | 5897    | 1059   | 17·9660                | 5·565                  |
| 38   | 78976   | 1045   | 1·3240                 | 75·929                 | 84   | 4838    | 919    | 18·9949                | 5·266                  |
| 39   | 77931   | 1082   | 1·3886                 | 71·994                 | 85   | 3919    | 787    | 20·0714                | 4·983                  |
| 40   | 76849   | 1116   | 1·4531                 | 68·823                 | 86   | 3132    | 664    | 21·1955                | 4·717                  |
| 41   | 75733   | 1149   | 1·5177                 | 65·876                 | 87   | 2468    | 552    | 22·3673                | 4·470                  |
| 42   | 74584   | 1180   | 1·5823                 | 63·211                 | 88   | 1916    | 452    | 23·5868                | 4·239                  |
| 43   | 73404   | 1208   | 1·6469                 | 60·716                 | 89   | 1464    | 364    | 24·8539                | 4·024                  |
| 44   | 72196   | 1235   | 1·7115                 | 58·411                 | 90   | 1100    | 287    | 26·1210                | 3·828                  |
| 45   | 70961   | 1266   | 1·7852                 | 56·022                 | 91   | 813     | 223    | 27·3882                | 3·651                  |
| 46   | 69695   | 1302   | 1·8682                 | 53·533                 | 92   | 590     | 169    | 28·6553                | 3·489                  |
| 47   | 68393   | 1340   | 1·9604                 | 51·020                 | 93   | 421     | 126    | 29·9225                | 3·342                  |
| 48   | 67053   | 1382   | 2·0617                 | 48·497                 | 94   | 295     | 92     | 31·1897                | 3·206                  |
| 49   | 65671   | 1426   | 2·1723                 | 46·041                 | 95   | 203     | 66     | 32·5032                | 3·077                  |
| 50   | 64245   | 1466   | 2·2829                 | 43·082                 | 96   | 137     | 46     | 33·8471                | 2·954                  |
| 51   | 62779   | 1502   | 2·3935                 | 41·771                 | 97   | 91      | 32     | 35·2034                | 2·841                  |
| 52   | 61277   | 1534   | 2·5041                 | 39·936                 | 98   | 59      | 21     | 36·5720                | 2·734                  |
| 53   | 59743   | 1562   | 2·6147                 | 38·241                 | 99   | 38      | 14     | 37·9710                | 2·634                  |
| 54   | 58181   | 1585   | 2·7253                 | 36·697                 | 100  | 24      | 24     | 39·3000                | 2·545                  |
| 55   | 56596   | 1614   | 2·8531                 | 35·051                 |      |         |        |                        |                        |



Equation of Life for the Members of Friendly Societies in the average of the Scotch Cities. This result will no doubt be unexpected by some inquirers, as Dundee has usually been held up as the type of unhealthy Cities; but the present results shew the necessity of extended observations before drawing any conclusions, the remarks made relative to the fluctuation of Mortality in Glasgow being equally applicable to Dundee. The following Abstract will give the comparative value of Male Life in the gross population of Glasgow, Liverpool, and Dundee.

| Age. | Expectation of Life in |                                                    |                     | Age. |
|------|------------------------|----------------------------------------------------|---------------------|------|
|      | Glasgow,<br>Table R.   | Liverpool,<br>Reg. Gen. page xxvii.<br>5th Report. | Dundee,<br>Table R. |      |
| 20   | 30.9665                | 33.0000                                            | 35.9632             | 20   |
| 25   | 27.8512                | 30.0000                                            | 32.4423             | 25   |
| 30   | 24.8998                | 27.0000                                            | 29.0866             | 30   |
| 35   | 22.1102                | 23.0000                                            | 25.8297             | 35   |
| 40   | 19.4532                | 21.0000                                            | 22.7017             | 40   |
| 45   | 16.9366                | 18.0000                                            | 19.8168             | 45   |
| 50   | 14.5350                | 16.0000                                            | 17.0891             | 50   |

The value of life in Dundee will thus be seen to stand higher than in either of the other Cities. If a complete system of Registration existed in Scotland accurate means would be afforded of carrying out a satisfactory inquiry as to the relative value of life in different Districts; but so far as the more imperfect system of Local Registration will admit of judging, it does not appear that the Duration of Life in the large Towns of Scotland should be regarded as so much below that of Cities in England.

Since the preceding paragraphs were written, in 1845, several ineffectual attempts were made to introduce a system of Registration into Scotland, but after many difficulties an Act was at last carried, namely, "The 17th and 18th Vict. c. 80," and which came into operation on the first day of the present year. It is at the same time satisfactory to find that the Legislature has availed itself of the experience gained under the English Registration Act, and has thereby provided for Scotland a Registration system commensurate with the views of those having a practical acquaintance in working such measures. The results will in a few years furnish to scientific inquirers that amount and character of data which are so necessary to the complete solution of many important political and social problems of the times.

It is deemed desirable to insert here the following Report of a Committee of the Statistical Society, consisting of Colonel Sykes, Dr. Bowring, Mr. Fletcher, Mr. Farr, and Mr. Neison.



*Report of the Registration Committee to the Council of the Statistical Society, 5th June, 1847.*

THE Scottish Registration Committee appointed by the Council on the 13th March, 1847, "to consider certain Schedules and Provisions of the proposed Registration Bill for Scotland, to recommend Forms, and to communicate with the proper Authority on the subject;" beg to report, that the Committee, at their Meeting on the 16th March, 1847, on examining the proposed Registration Bill, found the Schedules defective in the following particulars, viz.:

**In Marriage Schedule—**

1. The usual and present residence of the parties omitted.
2. Their ages not given; the parties being inadequately distinguished as "Minors," and of "Full Age."
3. The professions of the parties are omitted, while those of their parents are given instead.
4. "Civil Condition" given, but it would be worth while, in the case of widows and widowers, to know when the parties became such, and how often.
5. The number of children of each party by former marriage not obtained.
6. The place of birth of the parties marrying not stated.
7. The father's name only given, whereas the names of both parents should be furnished.

**In Births' Schedule—**

1. The items to determine child's identity, inadequate.
2. The birth-place of the parents omitted.
3. The marriage-place of the parents not given.
4. The number and sex of former children omitted.
5. The signatures of the parents from the Register Book should be required.
6. The certificate of the accoucheur, nurse, or persons present is omitted.
7. The place of registry omitted from the entry.

**In Deaths' Schedule—**

1. The arrangement of the name and description incomplete.
2. A certificate signed by the medical attendant should be required, stating the cause of death, and when the party was last seen by him.
3. The burial place and undertaker's name are omitted.
4. Place of birth and time of residence in the district omitted.
5. The rank or profession, and names of the parents omitted.
6. No statement as to whether married, to whom, at what age, or where.
7. Issue of the marriage living and dead, and the name and age of each should be furnished.
8. The signature of a witness, as well as of the informant, is wanting.

To remedy the defects now pointed out in the Schedules printed with the proposed Bill, the Committee suggested the substitution of the following three forms of Schedules, A, B, and C:—

[In order



# SCHEDULE A—MARRIAGES.

| COUNTY—Middlesex. |                                                                                                                                                                   |                            | DISTRICT—Marylebone.     |                          |                     | 1847. MARRIAGES Solemnised at the Parish Church of Marylebone. |                                   |                                                        |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|--------------------------|--------------------------|---------------------|----------------------------------------------------------------|-----------------------------------|--------------------------------------------------------|
| No.               | When, where, and how Married.                                                                                                                                     | Signatures of the Parties. | Residence.               |                          | Rank or Profession. | Condition.                                                     |                                   | Witnesses and Officiating Minister.                    |
|                   |                                                                                                                                                                   |                            | Present.                 | Usual.                   |                     | If a Widower or Date of decease of former Wives or Husbands.   | Children by each former Marriage. |                                                        |
| 11                | On March 3rd, 1847. At Marylebone Parish Church. Marriage after Banns, was solemnised between us according to the Rites and Ceremonies of the Established Church. | William Hastings           | 3, South St., Marylebone | Chelmsford, Essex        | Carpenter           | Widower, 1840 4 Nov., 1840                                     | 2                                 | Peter Hastings, dec. and Ann Hastings, m. n. Payne     |
|                   |                                                                                                                                                                   | Sophia Ann Mitchell        | 17, High St., Marylebone | 17, High St., Marylebone | Dressmaker          | Spinster                                                       | 1                                 | Geoffry Mitchell and Sarah Mitchell, m. n. Evans, dec. |
|                   |                                                                                                                                                                   |                            |                          |                          |                     |                                                                |                                   | John Hastings, Jane Mitchell, Witnesses.               |
|                   |                                                                                                                                                                   |                            |                          |                          |                     |                                                                |                                   | James Hollingshead, Vicar, Officiating Minister.       |

# SCHEDULE B.—BIRTHS.

| COUNTY—Middlesex. |                                               |      | DISTRICT—St. Pancras.                                        |                                       |                                                | SUB-DISTRICT—Tottenham Court.                                       |                                                                                                                      |                                                                                     |
|-------------------|-----------------------------------------------|------|--------------------------------------------------------------|---------------------------------------|------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| No.               | Name, and whether present or not.             | Sex. | When Born. Year. Day. Hour.                                  | Where Born. If in Lodgings—so stated. | Parents.                                       |                                                                     | Informants.                                                                                                          | Witnesses.                                                                          |
|                   |                                               |      |                                                              |                                       | Father.                                        | Mother.                                                             |                                                                                                                      |                                                                                     |
| 98                | William Aste (Present.)                       | M.   | 1847. February Eleventh. 5 <sup>h</sup> 30 <sup>m</sup> A.M. | 169, Tottenham Court Road.            | Name. Rank or Profession. Age. Birth-place.    | Name. Maiden name. Rank or Profession. Age. Birth-place.            | Signatures of Father and Mother and other Informants, and Residence if out of the house in which the birth occurred. | Accoucheur, Nurse by whom certified; and Signatures of Occupier or other Witnesses. |
|                   | Alteration of Name, if any, and date thereof. |      |                                                              |                                       | Henry Aste, Corn Dealer, 40, Tingewick, Bucks. | Harriet Aste, maiden name, Hills, (her 9th child,) 37, St. Pancras. | Henry Aste, Father<br>Harriet Aste, Mother                                                                           | Eupham. Curry, Nurse, Witness<br>Certified by M. Clayton, Accoucheur.               |
|                   |                                               |      |                                                              |                                       |                                                |                                                                     |                                                                                                                      | When, where, and by whom Registered.                                                |
|                   |                                               |      |                                                              |                                       |                                                |                                                                     |                                                                                                                      | 1847, March 10th, at 169, Tottenham Court Road.<br>John Wells, Registrar.           |

# SCHEDULE C—DEATHS.

| COUNTY—Middlesex. |                                   |       | DISTRICT—Poplar.                                                                                 |                                                                                         |                                                    | SUB-DISTRICT—Poplar.                                              |                                                       |                                                                                                                                                                                                                     |
|-------------------|-----------------------------------|-------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No.               | Description.                      |       | (1) Cause of Death. Disease. (2) Medical Attendant by whom Certified, when he last saw Deceased. | (1) Burial Place. (2) Undertaker by whom Certified.                                     | (1) Where Born, and (2) How long in this District. | (1) Parents' Names, and (2) Rank or Profession.                   | If Deceased was Married.                              |                                                                                                                                                                                                                     |
|                   | (1) Name, (2) Rank or Profession. | Age.  |                                                                                                  |                                                                                         |                                                    |                                                                   | Where, and at what age, and by whom.                  | Issue, in order of birth, their names and ages.                                                                                                                                                                     |
| 1476              | William Canty, Dock Labourer.     | M. 62 | 1847. February Twenty-eighth. 6 <sup>h</sup> A.M. At 16, Cottage Row.                            | Pneumonia, Two months. As certified by H. Bloomfield, M.D., who saw Deceased Feb. 27th. | County of Cork, Ireland. 36 years in Poplar.       | Timothy Canty, Shoemaker, dec.<br>Mary Canty, m. n. Nicolas, dec. | Scrill parish, Ireland, at age 22, to Honora M'Carty. | 1. Timothy, 31<br>2. William, 30<br>3. Mary, 29<br>4. John, dec. at 27, in 1846<br>5. Catherine, dec. at 1, in 1820<br>6. Stephen, 21                                                                               |
|                   |                                   |       |                                                                                                  | Catholic Burial Ground, Wade Street. As certified by M. Rutley, Undertaker.             |                                                    |                                                                   |                                                       | Signatures of (1) Informant, (2) Witness, and (3) Registrar, (4) Date of Registration.<br>Honora Canty, her + mark, Widow, Informant.<br>Mary Canty, daughter, Witness.<br>T. W. Gagen, Registrar, March 3rd, 1847. |



In order to determine whether any practical difficulties might be found in eliciting for registration the various facts required in those forms, the Committee caused an experiment to be made in several districts of the metropolis, and it was found that all the information needed could be readily obtained from the public, no objection arising on furnishing it. The results of this attempt at practically working out the Schedules were submitted to the Committee, and considered as satisfactory evidence that no insuperable difficulties existed in the way of carrying out the plan on a national scale. Copies of the three Schedules referred to were forwarded to Sir George Grey and the Lord Advocate of Scotland, and subsequently a deputation from the Committee waited on the Lord Advocate, and explained that the object which the Council had in view was simply to assist in securing for Scotland such a form of registration as the present advanced state of statistical science seemed to demand; and believing that a more complete and useful form of registry than that required under the proposed Bill might without difficulty be carried out, the Council of the Statistical Society was anxious that the people of Scotland should possess that system of registration which was best calculated to exhibit their true social and civil condition.

The attention of the Lord Advocate was next directed to the defects in the Schedules of the Bill then passing through the House, and the advantages which it is believed would arise from the adoption of the proposed Schedules A, B, and C were pointed out. Throughout the interview the Lord Advocate entered most fully and minutely into the arguments brought forward by the deputation, and promised to give the whole subject his particular consideration, although he could not engage to adopt all the suggested alterations; and he further expressed it as his opinion, that the better plan would be to pass the present Bills with but little alteration in the Schedules, and to introduce such provisions as would enable the competent authorities, with the sanction of the Queen in Council, to make such alterations and improvements in the modes of registration as experience may shew to be necessary and expedient.

Subsequently to this interview, it was considered advisable to forward Schedules, on the model of those suggested, for use to some district of Scotland in order to discover whether any difficulty was likely to arise in that part of the kingdom, with respect to the peculiar form of registration suggested. Dr. Watt, of Glasgow, who has had great experience in such matters, kindly undertook to practically test the Schedules in that city, and the Committee, at its meeting on the 15th ultimo, was furnished with the results obtained by Dr. Watt, consisting of a number of Registrations of the "Private Burials in the Cathedral burying-grounds," of "Poor buried at the public expense," and of "Burials by the Royal Infirmary of Glasgow." The following extract from a letter of Dr. Watt, will shew that he considers no difficulties exist in the way of getting the Schedules filled up:—



"As Mr. Farr did not state the time at which he wished the enclosed schedules returned to him, I have delayed making the returns till they could be filled up for a complete month. I regret, however, that some little delay has taken place in obtaining the returns for the poor buried at the public expense, and from the Royal Infirmary. These schedules have been filled up by the parties who make the returns for the Glasgow Mortality Bills, and who receive very small salaries for their respective labours. They offered to make out clean copies of the schedules, but I think it better to transmit them off hand in their original state.

"It will be observed that some of the lists are not so complete as could be wished. This arises from the informants not being aware that so much information was required of them. Were it known to the public that the various particulars stated in the schedules were required, I have no doubt but they could, without difficulty, be filled up with accuracy for Glasgow. *From what I know of the subject, I have no doubt but they would be filled up with perfect accuracy, provided care is taken to appoint properly qualified persons as registrars.*"

Your Committee was further of opinion that, in the event of such Schedules being adopted, great advantage would result to the public, by issuing forms of certificates embodying the principal facts intended to be set forth in the Schedules themselves, and that they should be delivered, by the respective Registrars, to the parties interested on the various occasions of Marriage, Birth, and Death. That these should be regarded as the "Original Certificates," and have appropriate counterparts, and that no other original certificates should ever be issued of any one of these events, but that any other documents of a similar kind which might be issued should only be a certified copy by the proper Registrar.

(A.)

## CERTIFICATE OF MARRIAGE.

DISTRICT, Marylebone. No. in Register, 11.

On March 3rd, 1847.

At Marylebone Parish Church.

MARRIAGE, *after Banns*, was solemnised between us, according to *the rites and ceremonies of the Established Church*.

SIGNATURE, *William Hastings*.

|                                               |                                                                                               |                                                        |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------|
| DESCRIPTION                                   | {                                                                                             | residence { present, } 3, South Street, Marylebone.    |
|                                               |                                                                                               | usual, } Chelmsford, Essex.                            |
|                                               | {                                                                                             | age, 32.                                               |
|                                               |                                                                                               | rank or profession, <i>carpenter</i> .                 |
|                                               |                                                                                               | condition, <i>widower</i> .                            |
|                                               |                                                                                               | if widower { former } first deceased in { children by, |
| { wives, } 1840, 4th Nov. { living 2, dead 1. |                                                                                               |                                                        |
| {                                             | birth-place, <i>Bristol</i> .                                                                 |                                                        |
|                                               | parents' names and { <i>Peter Hastings, dec., upholsterer, and Ann Hastings, M. N. Payne,</i> |                                                        |
|                                               | rank or profession, } <i>schoolmistress.</i>                                                  |                                                        |

C C



SIGNATURE, *Sophia Ann Mitchell.*

DESCRIPTION { residence { present, } 17, *High Street.*  
                   { usual, } *Ditto.*  
                   age, 20.  
                   rank or profession, *dressmaker.*  
                   condition, *spinster.*  
                   if widow { former } first deceased in } children by  
                               { husband } ... .. } living — dead —  
                   birth-place, *Longbridge, Deverell, Wilts.*  
                   parents' names and } *Geoffrey Mitchell, butcher, and Sarah Mitchell, M. N. Evans, dec.*  
                   rank or profession, }

WITNESSES, *John Hastings—Jane Mitchell.*

OFFICIATING MINISTER, *James Hollingshead, Vicar.*

(B.)

### CERTIFICATE OF BIRTH.

DISTRICT, *St. Pancras.* SUB-DISTRICT, *Tottenham Court.* No. in Register, 98.

CHILD, Name, and Sex, *William Aste*, (present,) born 5h. 30m., February 11th, 1847, at 169, *Tottenham Court Road.*

PARENTS—Father { name, *Henry Aste.*  
                           rank or profession, *corn dealer.*  
                           age, 40.  
                           born at *Tingewick, Bucks.*  
                           married first in 1830 at *St. Pancras.*  
                           issue, 4 boys, 4 girls, living; 1 girl dec.  
                           name, *Harriett Aste, M. N. Hills (her ninth child).*  
                           rank or profession,  
                           age, 37.  
                           born at *St. Pancras.*  
                           married first in (see *Father.*)  
                           issue, *ditto.*

INFORMANTS AND THEIR SIGNATURE, *Henry Aste, father; Harriett Aste, mother.*

WITNESSES, *Euphemia Curry*, nurse, certified by *M. Clayton*, accoucheur.

REGISTERED, on March 10th, 1847, at 169, *Tottenham Court Road*, by *John Wells, Registrar.*

(C.)

### CERTIFICATE OF DEATH.

DISTRICT, *Poplar.* SUB-DISTRICT, *Poplar.* No. in Register, 1746.

NAME { *William Canty.*  
           rank or profession, *dock labourer.*  
           sex, *male.*  
           age, 62.  
           died on the 28th of February, 1847, 6½, A.M., at 16, *Cottage Row.*

CAUSE OF DEATH, *Pneumonia, two months*, as certified by *H. Bloomfield*, who last saw deceased February 27th, 1847.

Burial place, *Catholic burial-ground, Wade Street*, as certified by *M. Rutley, undertaker.*

BORN AT *county of Cork, Ireland; lived in this district, 36 years in Poplar.*



Parents' names and } Father—*Timothy Canty, shoemaker, dec.*  
rank or profession, } Mother—*Mary Canty, M. N. Nicholas, dec.*

MARRIED in the *parish of Scrill, Ireland, at the age of 22, to Honora M'Carty, by whom he had*

ISSUE, (1) *Timothy, 31, (2) William, 30, (3) Mary, 29, (4) John, dec. at 27, in 1846, (5) Catherine, dec. at 1, in 1820, (6) Stephen, 21.*

INFORMANT, *Honora Canty, her × mark, widow.*

WITNESS, *Mary Canty, daughter.*

REGISTERED on March 3rd, 1847, by *T. W. Gagen, Registrar.*

The Committee, after having given much attention to this subject, are convinced that the adoption of the proposed system of registration possesses scientific and legal merits beyond those of any other yet proposed in this country, and they regret that the framers of the Registration Bill for Scotland have not wholly concurred with them in their view of the question. As it is now understood, however, that the Bill will not pass during the present session of Parliament, and that the whole is likely to be further considered, it is to be hoped, from the willingness which the Lord Advocate evinced to introduce an efficient mode of registration, that reason will be found hereafter to carry out the system proposed by your Committee.

*5th June, 1847.*

On referring to the Schedules of the Registration Act for Scotland, the 17th and 18th Vict. c. 80, it will be found that they are almost identical with the preceding forms recommended for adoption by the Committee of the Statistical Society, and it is to be hoped, that the advantages to arise from so complete a form of Registration, will induce the Legislature to extend the improvements to the system now in use in England. It is very likely that in the first attempts to carry out these Schedules some difficulties will be experienced in Scotland, where no National Registration formerly existed, and during the first few years, the people will need to be instructed as to the precise kind of information required to be furnished in the event of a Birth, Death, or Marriage. At the date of the Committee drawing up the preceding Report, the practicability of the scheme was tested by Mr. Farr personally, in two different districts of the metropolis, and also by Dr. Watt in Glasgow, and the experiments fully satisfied the Committee that any attempt to carry out the system on a large scale must be successful, and that any difficulties which might be experienced at the beginning could only be of a temporary duration.

For many purposes, the mode of representing the value of life at various ages, under the expression "Expectation of Life," will be found inadequate. The method by which that value is obtained for a given age, involves the consideration of the decrements of life at every superior age; and therefore, in any Table, the Expectation of Life, even at younger ages, will be affected by the irregularities of mortality at the older ages. It



consequently sometimes happens that a comparison of different Tables, especially at the younger and middle periods of life, may shew an equal or nearly equal Expectation while there are in reality very different chances under the two Tables of living a given number of years; and again, Expectation Tables may shew very different values for the same age, when according to the nature of the data there are equal chances of living the same number of years.

From what has been said it will be seen, that although the "Expectation of Life" expresses the true average duration in years of a certain number of individuals at a given age, yet it does not represent the chances of surviving an equivalent number of years; and consequently, for medical and other purposes, in which it is required to determine the relative value, improvement, or other change which may have taken place within a given period of life, another expression must be found. The Equation of Life, which represents a term of years for which there is an equal probability of living, appears to be the best mode to determine the comparative value of life in different Classes or different Districts, within the same period of years, as the expression is affected by the mortality within those ages only. In order to shew the relation which the Equation of Life bears to the Expectation of Life, the expression under each form, corresponding to the decennial ages, are given for various classes of results in

TABLE U.  
EQUATION OF LIFE.—ENGLAND AND WALES.

| Age. | ENGLAND AND WALES. |              |           |              | FRIENDLY SOCIETIES (Males). |              |                 |              |                 |              |                      |              | FEMALES.             |              | Age. |
|------|--------------------|--------------|-----------|--------------|-----------------------------|--------------|-----------------|--------------|-----------------|--------------|----------------------|--------------|----------------------|--------------|------|
|      | Males.             |              | Females.  |              | Rural Districts.            |              | Town Districts. |              | City Districts. |              | Rural, Town, & City. |              | Rural, Town, & City. |              |      |
|      | Equation.          | Expectation. | Equation. | Expectation. | Equation.                   | Expectation. | Equation.       | Expectation. | Equation.       | Expectation. | Equation.            | Expectation. | Equation.            | Expectation. |      |
| 10   | 52.305             | 47.756       | 53.554    | 48.383       | 58.375                      | 53.258       | 54.315          | 50.537       | 51.743          | 47.913       | 56.408               | 51.810       | 56.749               | 49.493       | 10   |
| 20   | 44.212             | 40.691       | 43.706    | 41.598       | 49.353                      | 45.355       | 45.201          | 42.274       | 43.052          | 40.015       | 47.434               | 43.774       | 49.702               | 45.264       | 20   |
| 30   | 36.482             | 34.099       | 38.066    | 35.167       | 40.813                      | 38.407       | 36.517          | 34.575       | 34.920          | 32.860       | 38.972               | 36.605       | 41.017               | 38.184       | 30   |
| 40   | 28.790             | 27.476       | 30.412    | 28.733       | 32.129                      | 30.972       | 28.135          | 27.153       | 27.218          | 26.087       | 30.531               | 29.331       | 32.248               | 30.781       | 40   |
| 50   | 21.255             | 20.846       | 22.697    | 22.055       | 23.609                      | 23.470       | 20.053          | 19.973       | 20.056          | 19.927       | 22.344               | 22.192       | 23.894               | 23.820       | 50   |
| 60   | 14.285             | 14.585       | 15.355    | 15.523       | 15.923                      | 16.652       | 12.815          | 13.761       | 13.295          | 13.769       | 14.945               | 15.694       | 16.236               | 17.238       | 60   |

SCOTLAND.—FRIENDLY SOCIETIES.—Males.

| Age. | Rural Districts. |              | Town Districts. |              | City Districts. |              | Rural, Town, and City. |              | Age. |
|------|------------------|--------------|-----------------|--------------|-----------------|--------------|------------------------|--------------|------|
|      | Equation.        | Expectation. | Equation.       | Expectation. | Equation.       | Expectation. | Equation.              | Expectation. |      |
| 10   | 57.474           | 53.051       | 55.828          | 50.743       | 43.371          | 42.637       | 54.567                 | 50.803       | 10   |
| 20   | 48.467           | 44.990       | 46.407          | 42.752       | 34.753          | 34.586       | 45.656                 | 42.722       | 20   |
| 30   | 39.995           | 37.783       | 37.106          | 35.040       | 27.831          | 28.635       | 37.478                 | 35.651       | 30   |
| 40   | 31.493           | 30.305       | 28.020          | 27.641       | 21.255          | 22.647       | 29.539                 | 28.657       | 40   |
| 50   | 23.266           | 22.898       | 19.441          | 20.742       | 16.409          | 17.386       | 21.917                 | 21.812       | 50   |
| 60   | 15.990           | 16.018       | 11.217          | 13.121       | 12.688          | 13.335       | 15.174                 | 15.018       | 60   |



## TRADES IN FRIENDLY SOCIETIES (MALES) ENGLAND.

| Age. | Labourers.<br>Rural Districts. |              | Clerks.<br>Rural, Town, and City. |              | Plumbers, Painters,<br>and Glaziers.<br>Rural, Town, and City. |              | Bakers.<br>Rural, Town, and City. |              | Miners.<br>Rural, Town, and City. |              | Age. |
|------|--------------------------------|--------------|-----------------------------------|--------------|----------------------------------------------------------------|--------------|-----------------------------------|--------------|-----------------------------------|--------------|------|
|      | Equation.                      | Expectation. | Equation.                         | Expectation. | Equation.                                                      | Expectation. | Equation.                         | Expectation. | Equation.                         | Expectation. |      |
| 10   | 61.512                         | 56.005       | 41.920                            | 39.985       | 46.666                                                         | 43.066       | 49.546                            | 47.982       | 51.402                            | 48.516       | 10   |
| 20   | 52.240                         | 47.906       | 33.500                            | 31.835       | 39.101                                                         | 36.904       | 41.034                            | 40.027       | 42.186                            | 40.670       | 20   |
| 30   | 43.341                         | 40.597       | 27.416                            | 27.576       | 31.262                                                         | 30.508       | 33.039                            | 32.357       | 33.187                            | 33.157       | 30   |
| 40   | 34.349                         | 32.769       | 19.945                            | 21.857       | 23.508                                                         | 24.305       | 25.001                            | 24.476       | 24.067                            | 24.920       | 40   |
| 50   | 25.634                         | 25.075       | 13.548                            | 16.046       | 15.384                                                         | 17.096       | 19.470                            | 19.091       | 15.890                            | 17.535       | 50   |
| 60   | 17.574                         | 17.821       | 11.616                            | 12.426       | 9.779                                                          | 12.168       | 13.630                            | 14.063       | 10.414                            | 11.859       | 60   |

The terms in the respective columns headed Equation, were determined as follows:—

Let  $\epsilon_x$  = the number alive in the columns headed "Living" in Tables C, F, I, &c., &c., at the given age  $x$ .

Then  $\frac{\epsilon_x}{2}$  = the number alive at an advanced age  $x+n$  which will always be intermediate between the proximate years of age  $x+n-\phi$ , and  $x+n+1-\phi$  the fraction  $\phi$  of which is determined as follows:—

$$\lambda (\epsilon_{x+n-\phi} - \epsilon_{x+n}) - \lambda (\epsilon_{x+n-\phi} - \epsilon_{x+n+1-\phi}),$$

$$\text{or } \phi = \frac{\epsilon_{x+n-\phi} - \epsilon_{x+n}}{\epsilon_{x+n-\phi} - \epsilon_{x+n+1-\phi}}$$

$$\text{where } \epsilon_{x+n} = \frac{1}{2} \epsilon_x.$$

An inspection of Table U will shew, that at the earlier ages the Equation of Life always exceeds the Expectation, and at those ages there is always an even chance of outliving the period of years represented by the Expectation of Life; but the converse is the case for the older ages. It will be further seen, that in those Tables giving a higher absolute value to Life, the Equation retains its superiority over the Expectation till a more advanced period of years; or in other words, if the Equation and Expectation of Life in any Table be compared, the more advanced the period of life at which the two expressions approximate to equal values, the higher is the absolute value of life throughout that Table. An example of this will be seen in observing the respective terms for the City and Rural Districts, in the former of which the approximation happens ten years earlier than in the other: again, if the results for the Labourers in the Rural Districts be compared with the results for Clerks, thirty years' difference will be found; and on comparison of the results for other Classes in Table U, intermediate periods of approximation will appear.



## ON THE RATE OF MORTALITY IN THE MEDICAL PROFESSION.

RECENTLY I have had occasion to investigate the rate of mortality among two different classes of medical men; the one class being the Officers of the Medical Department of the Royal Army, and the other, the Members of the Royal Medical Chirurgical Society. The facts relating to the former were collected from the records of the Society formed for the benefit of the Widows of the Officers of the Medical Department of Her Majesty's Army, established in the year 1816, and the facts relating to the latter class were abstracted from the books of the Royal Medical Chirurgical Society, established in the year 1805.

The investigation, so far as related to the first group of facts, was required to be conducted with the greatest care and scrutiny, as the management of large pecuniary interests depended on the results. The utmost care was, therefore, exercised in this part of the analysis. Inquirers into vital statistics had not hitherto touched the question of the mortality among the members of the medical department of the army, but from their peculiar duties, and the varied climates to which so many of them are exposed, there was reason to believe that some unusual feature would shew itself in the mortality to which they are subject, and, therefore, under this conviction, it appeared absolutely necessary to determine, from the records of the Society, the rate of mortality to which its own members had been subject. After a somewhat laborious and very troublesome analysis of all the information procurable, the following exhibits the results arrived at. In the course of this analysis it was discovered that the social condition of the members had an important influence on the rate of mortality: and it was rendered necessary finally to exhibit the rate of mortality in connection with these conditions. It will be found that the results are not only exceedingly curious but of great practical importance.

In the following Table are exhibited the principal elementary facts from which to determine the rate of mortality among the members of the Society, who entered it unmarried, from its establishment, in 1816, until the 1st of January, 1851; excluding only such members as entered it in the married condition of life.

[The arrangement



TABLE I.  
*Mortality among Members entering Single.*

| Age.     | Number Entered<br>at each Age. | Number remain-<br>ing under Ob-<br>servation from<br>Age preceding. | Total Number<br>under Obser-<br>vation at each<br>Age. | Died.    | Struck off. | Discontinued. | Alive.   | Total gone off. | Half of  |             |                    |          | Number<br>Exposed to<br>Risk. |
|----------|--------------------------------|---------------------------------------------------------------------|--------------------------------------------------------|----------|-------------|---------------|----------|-----------------|----------|-------------|--------------------|----------|-------------------------------|
|          |                                |                                                                     |                                                        |          |             |               |          |                 | Entered. | Struck off. | Discon-<br>tinued. | Total.   |                               |
| <i>a</i> | <i>b</i>                       | <i>c</i>                                                            | <i>d</i>                                               | <i>e</i> | <i>f</i>    | <i>g</i>      | <i>h</i> | <i>i</i>        | <i>j</i> | <i>k</i>    | <i>l</i>           | <i>m</i> | <i>n</i>                      |
| 17       | 3                              | ..                                                                  | 3                                                      | ..       | ..          | ..            | ..       | ..              | 1.5      | ..          | ..                 | 1.5      | 1.5                           |
| 18       | 1                              | 3                                                                   | 4                                                      | ..       | ..          | ..            | ..       | ..              | .5       | ..          | ..                 | .5       | 3.5                           |
| 19       | 2                              | 4                                                                   | 6                                                      | ..       | ..          | ..            | ..       | ..              | 1        | ..          | ..                 | 1        | 5                             |
| 20       | 21                             | 6                                                                   | 27                                                     | 2        | ..          | ..            | ..       | 2               | 10.5     | ..          | ..                 | 10.5     | 16.5                          |
| 21       | 99                             | 25                                                                  | 124                                                    | 9        | ..          | 3             | ..       | 12              | 49.5     | ..          | 1.5                | 51       | 73                            |
| 22       | 141                            | 112                                                                 | 253                                                    | 12       | 7           | 5             | 5        | 29              | 70.5     | 3.5         | 2.5                | 76.5     | 176.5                         |
| 23       | 195                            | 224                                                                 | 419                                                    | 17       | 6           | 12            | 14       | 49              | 97.5     | 3           | 6                  | 106.5    | 312.5                         |
| 24       | 153                            | 370                                                                 | 523                                                    | 11       | 9           | 8             | 11       | 39              | 76.5     | 4.5         | 4                  | 85       | 438                           |
| 25       | 168                            | 484                                                                 | 652                                                    | 26       | 15          | 12            | 25       | 78              | 84       | 7.5         | 6                  | 97.5     | 554.5                         |
| 26       | 133                            | 574                                                                 | 707                                                    | 25       | 19          | 24            | 24       | 92              | 66.5     | 9.5         | 12                 | 88       | 619                           |
| 27       | 62                             | 615                                                                 | 677                                                    | 10       | 15          | 16            | 25       | 66              | 31       | 7.5         | 8                  | 46.5     | 630.5                         |
| 28       | 41                             | 611                                                                 | 652                                                    | 12       | 19          | 14            | 25       | 70              | 20.5     | 9.5         | 7                  | 37       | 615                           |
| 29       | 32                             | 582                                                                 | 614                                                    | 15       | 12          | 12            | 22       | 61              | 16       | 6           | 6                  | 28       | 586                           |
| 30       | 17                             | 553                                                                 | 570                                                    | 10       | 12          | 12            | 23       | 57              | 8.5      | 6           | 6                  | 20.5     | 549.5                         |
| 31       | 31                             | 513                                                                 | 544                                                    | 13       | 5           | 10            | 28       | 56              | 15.5     | 2.5         | 5                  | 23       | 521                           |
| 32       | 32                             | 488                                                                 | 520                                                    | 17       | 6           | 5             | 29       | 57              | 16       | 3           | 2.5                | 21.5     | 498.5                         |
| 33       | 24                             | 463                                                                 | 487                                                    | 12       | 2           | 4             | 20       | 38              | 12       | 1           | 2                  | 15       | 472                           |
| 34       | 28                             | 449                                                                 | 477                                                    | 8        | 5           | 7             | 22       | 42              | 14       | 2.5         | 3.5                | 20       | 457                           |
| 35       | 25                             | 435                                                                 | 460                                                    | 11       | 3           | 6             | 15       | 35              | 12.5     | 1.5         | 3                  | 17       | 443                           |
| 36       | 19                             | 425                                                                 | 444                                                    | 7        | 3           | 4             | 17       | 31              | 9.5      | 1.5         | 2                  | 13       | 431                           |
| 37       | 13                             | 413                                                                 | 416                                                    | 12       | 4           | 7             | 12       | 35              | 6.5      | 2           | 3.5                | 12       | 404                           |
| 38       | 12                             | 391                                                                 | 403                                                    | 7        | ..          | 4             | 8        | 19              | 6        | ..          | 2                  | 8        | 395                           |
| 39       | 20                             | 384                                                                 | 404                                                    | 4        | 2           | 4             | 9        | 19              | 10       | 1           | 2                  | 13       | 391                           |
| 40       | 14                             | 385                                                                 | 399                                                    | 10       | 1           | 4             | 6        | 21              | 7        | .5          | 2                  | 9.5      | 389.5                         |
| 41       | 9                              | 378                                                                 | 387                                                    | 14       | 3           | 8             | 11       | 36              | 4.5      | 1.5         | 4                  | 10       | 377                           |
| 42       | 9                              | 351                                                                 | 360                                                    | 12       | 1           | 11            | 5        | 29              | 4.5      | .5          | 5.5                | 10.5     | 349.5                         |
| 43       | 3                              | 331                                                                 | 334                                                    | 5        | 1           | 7             | 1        | 14              | 1.5      | .5          | 3.5                | 5.5      | 328.5                         |
| 44       | 6                              | 320                                                                 | 326                                                    | 3        | 1           | 5             | 4        | 13              | 3        | .5          | 2.5                | 6        | 320                           |
| 45       | 6                              | 313                                                                 | 319                                                    | 5        | 2           | 4             | 7        | 18              | 3        | 1           | 2                  | 6        | 313                           |
| 46       | 3                              | 301                                                                 | 304                                                    | 7        | 2           | 2             | 4        | 15              | 1.5      | 1           | 1                  | 3.5      | 300.5                         |
| 47       | 4                              | 289                                                                 | 293                                                    | 3        | 1           | 2             | 4        | 10              | 2        | .5          | 1                  | 3.5      | 289.5                         |
| 48       | 3                              | 283                                                                 | 286                                                    | 4        | 1           | 7             | 7        | 19              | 1.5      | .5          | 3.5                | 5.5      | 280.5                         |
| 49       | ..                             | 267                                                                 | 267                                                    | 5        | 1           | 6             | 5        | 17              | ..       | .5          | 3                  | 3.5      | 263.5                         |
| 50       | ..                             | 250                                                                 | 250                                                    | 6        | ..          | 1             | 2        | 9               | ..       | ..          | .5                 | .5       | 249.5                         |
| 51       | 2                              | 241                                                                 | 243                                                    | 6        | 3           | 4             | 5        | 18              | 1        | 1.5         | 2                  | 4.5      | 238.5                         |
| 52       | ..                             | 225                                                                 | 225                                                    | 5        | 1           | 6             | 1        | 13              | ..       | .5          | 3                  | 3.5      | 221.5                         |
| 53       | ..                             | 212                                                                 | 212                                                    | 2        | 1           | 3             | 2        | 8               | ..       | .5          | 1.5                | 2        | 210                           |
| 54       | 3                              | 204                                                                 | 207                                                    | 8        | ..          | 1             | 3        | 12              | 1.5      | ..          | .5                 | 2        | 205                           |
| 55       | 2                              | 195                                                                 | 197                                                    | 5        | ..          | 3             | 4        | 12              | 1        | ..          | 1.5                | 2.5      | 194.5                         |
| 56       | ..                             | 185                                                                 | 185                                                    | 4        | 4           | 2             | 9        | 19              | ..       | 2           | 1                  | 3        | 182                           |
| 57       | 1                              | 166                                                                 | 167                                                    | ..       | ..          | 2             | 3        | 5               | .5       | ..          | 1                  | 1.5      | 165.5                         |
| 58       | ..                             | 162                                                                 | 162                                                    | 7        | 2           | 7             | 10       | 26              | ..       | 1           | 3.5                | 4.5      | 157.5                         |
| 59       | 1                              | 136                                                                 | 137                                                    | 3        | 1           | 4             | 8        | 16              | .5       | ..          | 2                  | 3        | 134                           |
| 60       | ..                             | 121                                                                 | 121                                                    | 1        | ..          | 1             | 11       | 13              | ..       | .5          | .5                 | .5       | 120.5                         |
| 61       | ..                             | 108                                                                 | 108                                                    | 3        | 2           | ..            | 6        | 11              | ..       | 1           | ..                 | 1        | 107                           |
| 62       | ..                             | 97                                                                  | 97                                                     | 2        | ..          | ..            | 9        | 11              | ..       | ..          | ..                 | ..       | 97                            |
| 63       | ..                             | 86                                                                  | 86                                                     | 4        | ..          | 2             | 5        | 11              | ..       | ..          | 1                  | 1        | 85                            |
| 64       | ..                             | 75                                                                  | 75                                                     | 2        | ..          | 2             | 4        | 8               | ..       | ..          | 1                  | 1        | 74                            |
| 65       | 1                              | 67                                                                  | 68                                                     | 2        | 2           | ..            | 3        | 7               | .5       | 1           | ..                 | 1.5      | 66.5                          |
| 66       | 1                              | 61                                                                  | 62                                                     | 3        | 1           | 1             | 6        | 11              | .5       | ..          | .5                 | 1.5      | 60.5                          |
| 67       | ..                             | ..                                                                  | 51                                                     | 1        | ..          | ..            | 5        | 6               | ..       | .5          | ..                 | ..       | 51                            |
| 68       | ..                             | ..                                                                  | 45                                                     | 2        | 1           | 1             | 4        | 8               | ..       | ..          | .5                 | 1        | 44                            |
| 69       | ..                             | ..                                                                  | 37                                                     | ..       | ..          | ..            | 4        | 4               | ..       | .5          | ..                 | ..       | 37                            |
| 70       | ..                             | ..                                                                  | 33                                                     | 3        | ..          | ..            | 3        | 6               | ..       | ..          | ..                 | ..       | 33                            |
| 71       | ..                             | ..                                                                  | 27                                                     | ..       | ..          | ..            | 2        | 2               | ..       | ..          | ..                 | ..       | 27                            |
| 72       | ..                             | ..                                                                  | 25                                                     | 2        | ..          | ..            | 2        | 4               | ..       | ..          | ..                 | ..       | 25                            |
| 73       | ..                             | ..                                                                  | 21                                                     | 2        | ..          | ..            | 1        | 3               | ..       | ..          | ..                 | ..       | 21                            |
| 74       | ..                             | ..                                                                  | 18                                                     | 1        | ..          | 2             | 2        | 5               | ..       | ..          | 1                  | 1        | 17                            |
| 75       | ..                             | ..                                                                  | 13                                                     | ..       | ..          | ..            | 2        | 2               | ..       | ..          | ..                 | ..       | 13                            |
| 76       | ..                             | ..                                                                  | 11                                                     | ..       | ..          | 1             | 1        | 2               | ..       | ..          | .5                 | .5       | 10.5                          |
| 77       | ..                             | ..                                                                  | 9                                                      | 1        | ..          | ..            | 2        | 3               | ..       | ..          | ..                 | ..       | 9                             |
| 78       | ..                             | ..                                                                  | 6                                                      | 2        | ..          | ..            | ..       | 2               | ..       | ..          | ..                 | ..       | 6                             |
| 79       | ..                             | ..                                                                  | 4                                                      | ..       | ..          | ..            | 1        | 1               | ..       | ..          | ..                 | ..       | 4                             |
| 80       | ..                             | ..                                                                  | 3                                                      | 1        | ..          | ..            | 1        | 2               | ..       | ..          | ..                 | ..       | 3                             |
| 81       | ..                             | ..                                                                  | 1                                                      | ..       | ..          | ..            | 1        | 1               | ..       | ..          | ..                 | ..       | 1                             |
| 82       | ..                             | ..                                                                  | ..                                                     | ..       | ..          | ..            | ..       | ..              | ..       | ..          | ..                 | ..       | ..                            |
| 83       | ..                             | ..                                                                  | ..                                                     | ..       | ..          | ..            | ..       | ..              | ..       | ..          | ..                 | ..       | ..                            |
| 84       | ..                             | ..                                                                  | ..                                                     | ..       | ..          | ..            | ..       | ..              | ..       | ..          | ..                 | ..       | ..                            |
| 85       | ..                             | ..                                                                  | ..                                                     | ..       | ..          | ..            | ..       | ..              | ..       | ..          | ..                 | ..       | ..                            |
|          | 1,340                          | ..                                                                  | 15,567                                                 | 386      | 176         | 268           | 510      | 1,340           | 670.0    | 88.0        | 134.0              | 892.0    | 14675.0                       |



The arrangement of this Table is very simple, and will be readily understood by those giving attention to such inquiries; but to those not familiar with them, the following explanation may be useful.

Column (*a*) Represents the age at which each officer entered the society, or when some other event connected therewith took place.

(*b*) The number of officers entered at each age.

(*c*) The number of officers remaining under observation from each preceding age, and the residue of all those entering in each preceding age, who have not become subject to any of the contingent events represented in the adjoining columns. For example, three officers entered at the age of 17, and not falling under the events specified in the adjoining columns, they survive until the succeeding age, and come under observation as officers of the age of 18.

(*d*) Again, 1 officer entered at the age of 18, who, with the 3 remaining from those that entered the society at the age of 17, makes 4, coming under observation at some time or other after completing the 17th year of their life, and before completing the 18th year; none of these become subject to any of the events specified, and the whole 4 are therefore carried under observation to the following age, 19, when 2 other officers entered the society, making 6 under observation at the age of 19. Again, at age 25, 168 officers entered the society, who, with 484 remaining under observation from the preceding age, make altogether 652 under observation at the age of 25. Of these, 26 die during the course of that year, 15 are struck off, and 12 discontinue, while 25, who have recently entered the society, remain alive on the 1st of January, 1851, and, therefore, are no longer observed; 78 officers, in all, therefore, go from under observation at the age of 25, and 574 are carried forward to the succeeding age of 26, which, with 133 entered at that age, brings 707 officers altogether under review at the age of 26.

(*e*) Represents the numbers dying at each age or term of life.

(*f*) Those who are struck off.

(*g*) Those who discontinue.

(*h*) Represents the number of officers alive on the 1st of January, 1851, and who have not become subject to any of the contingent events represented in columns *e* to *g* inclusive.

(*i*) Contains the total of columns *e* to *h*, inclusive, and represents the number of officers who cease to come under observation in any of the more advanced ages. For example, at the age 30, column *d* represents 570 under observation; but before attaining the 31st year of age, 57 of these pass from observation, leaving 513 to come under observation in the 31st year of age, as shewn in column *c*.

(*j*) Represents one-half of the numbers entering the society at each year of life at which admissions take place, and is, therefore, one-half of the numbers in column *b*. In like manner, column

(*k*) Represents one-half of the numbers in column *f*. In like manner, column

(*l*) Represents one-half the numbers in column *g*; and column

(*m*) The total of columns *j*, *k*, and *l*. The purpose of these four columns will appear in the explanation of column

(*n*) Which represents the number of lives exposed a complete year to the risk of mortality while connected with the society, and the figures in this column are produced by subtracting from the numbers in column *d* the numbers in column *m* opposite the same age. As already stated, column *d* contains the gross number under observation at some time or other throughout the year of life set forth in column *a*; but as column *b* contains, for each age up to 66, the numbers who have entered the society, and as officers, one with another, enter at different periods throughout the year, it has been found, by observation, that on an average each is, during the year of entry, exposed to only six months, or one half-year's mortality, and hence column *j* represents that amount of risk for all officers who have just joined the society. In like manner columns *k* and *l* represent the amount of risk to which officers discontinued from the society for either of the causes specified in those columns, are exposed, on the principle that, one with another, the discontinuances will take place in the middle of the year. It thus appears that as column *m* is the total of *j*, *k*, and *l*, it shews the proper number to be deducted from column *d*, in order to find the number exposed to the risk of a whole year's mortality.



The following Abstract, A, will make the contents of the preceding Table better understood.

ABSTRACT A.

| Ages.      | Number Exposed to Risk. | Died. | Mortality per Cent. |
|------------|-------------------------|-------|---------------------|
| 20 to 24   | 1016.5                  | 51    | 5.017               |
| 25 ... 29  | 3005.0                  | 88    | 2.928               |
| 30 ... 34  | 2498.0                  | 60    | 2.402               |
| 35 ... 39  | 2064.0                  | 41    | 1.986               |
| 40 ... 44  | 1764.5                  | 44    | 2.494               |
| 45 ... 49  | 1447.0                  | 24    | 1.660               |
| 50 ... 54  | 1124.5                  | 27    | 2.401               |
| 55 ... 59  | 833.5                   | 19    | 2.280               |
| 60 ... 64  | 483.5                   | 12    | 2.482               |
| 65 ... 69  | 259.0                   | 8     | 3.089               |
| 70 ... 74  | 123.0                   | 8     | 6.504               |
| 75 ... 79  | 42.5                    | 3     | 7.059               |
| 80 ... 84  | 4.0                     | 1     | 25.000              |
| Total..... | 14665.0                 | 386   | 2.632               |

It is thus seen that during 14,665 years of risk, to which the members whose experience is recorded in Table I were exposed, no less than 386 died, or 2.632 per cent., while the mortality according to the average for the whole male population of England and Wales at corresponding ages is 1.888 per cent. But what is most striking about these results is the very excessive mortality at the ages under 55, and the reduced mortality at the ages 55 and upwards. This will be found to exceed not only the mortality of the male population of England and Wales at the mature and active term of life, but to be actually about equal to that of the officers of the Bengal military service at the corresponding ages. The following exhibits the results for each of the three classes:—

Mortality in the term of life, 20–54 among

The Members of the Medical Department of the Army = 2.593 per cent.

The Officers of the Bengal Army . . . . . = 2.635 ...

The Male Population of England and Wales . . . . . = 1.155 ...

It is thus evident that the rate of mortality among the members of the medical department of the army, who entered the Society while unmarried, does not differ widely



from that found to prevail among the officers of the Bengal army ; but at the same time it will be found to exceed the rate of mortality among the male population of this country by 124·502 per cent. This very striking and unexpected result at once proved the necessity for an accurate analysis of the rate of mortality among the members of the Society.

In the preceding Abstract A, there is one feature which cannot fail to arrest attention : the remarkably high and unprecedented mortality at the younger ages, which gradually decreases up to the age of 40. The following shews the mortality per cent. for each quinquennium in the three preceding groups of observations :—

| Ages.     | Medical Department of the Royal Army. | Bengal Military Fund. | Male Population of England and Wales. |
|-----------|---------------------------------------|-----------------------|---------------------------------------|
| 20 to 24  | 5·017                                 | 2·324                 | 0·845                                 |
| 25 ... 29 | 2·928                                 | 2·501                 | 0·981                                 |
| 30 ... 34 | 2·402                                 | 2·779                 | 1·049                                 |
| 35 ... 39 | 1·986                                 | 2·864                 | 1·134                                 |

The mortality at the younger ages in the medical department of the army is certainly a circumstance of much importance; and on more grounds than one, calls for investigation and inquiry : but in order to shew how very diversified is the rate of mortality in individual classes of the community, it may be well to direct attention to the remarkable contrasts in the results of the three preceding groups, at ages 55 and upwards, or rather within the term of life, 55–84.

The rate of mortality in each of the following classes in the term of life 55–84 :

Members of the Medical Department of the Royal Army = 2·922 per cent.

Officers of the Bengal Army . . . . . = 5·652 ...

Male Population of England and Wales . . . . . = 5·056 ...

The very low rate of mortality at the advanced ages among the members of the medical department of the army, as set forth in Abstract A, is just as remarkable as the excessive rate found to prevail at the younger ages.

So much having been said on the rate of mortality among those members who entered the Society while single or unmarried, attention will next be directed to those who joined the Society as married members.

The explanation already given of the construction of Table I will be equally applicable to the following Table, and, therefore, need not be repeated.

[The following



TABLE II.

*Mortality of those who entered Married.*

| Age. | Number Entered<br>at each Age. | Number remain-<br>ing under Ob-<br>servation from<br>Age preceding. | Total Number<br>under Observa-<br>tion at each<br>Age. | Died. | Struck off. | Discontinued. | Alive. | Total gone off. | Half of  |             |                    |        | Number<br>Exposed<br>to Risk. |
|------|--------------------------------|---------------------------------------------------------------------|--------------------------------------------------------|-------|-------------|---------------|--------|-----------------|----------|-------------|--------------------|--------|-------------------------------|
|      |                                |                                                                     |                                                        |       |             |               |        |                 | Entered. | Struck off. | Discon-<br>tinued. | Total. |                               |
| 21   | 1                              | ..                                                                  | 1                                                      | ..    | ..          | ..            | ..     | ..              | .5       | ..          | ..                 | .5     | .5                            |
| 22   | 1                              | 1                                                                   | 2                                                      | ..    | ..          | 1             | ..     | 1               | .5       | ..          | .5                 | 1      | 1                             |
| 23   | 1                              | 1                                                                   | 2                                                      | ..    | ..          | ..            | ..     | ..              | .5       | ..          | ..                 | .5     | 1.5                           |
| 24   | 3                              | 2                                                                   | 5                                                      | ..    | ..          | 1             | ..     | 1               | 1.5      | ..          | .5                 | 2      | 3                             |
| 25   | 3                              | 4                                                                   | 7                                                      | ..    | ..          | ..            | ..     | ..              | 1.5      | ..          | ..                 | 1.5    | 5.5                           |
| 26   | 8                              | 7                                                                   | 15                                                     | ..    | ..          | ..            | ..     | ..              | 4        | ..          | ..                 | 4      | 11                            |
| 27   | 5                              | 15                                                                  | 20                                                     | 1     | ..          | ..            | ..     | 1               | 2.5      | ..          | ..                 | 2.5    | 17.5                          |
| 28   | 6                              | 19                                                                  | 25                                                     | ..    | ..          | ..            | ..     | ..              | 3        | ..          | ..                 | 3      | 22                            |
| 29   | 6                              | 25                                                                  | 31                                                     | ..    | ..          | ..            | ..     | ..              | 3        | ..          | ..                 | 3      | 28                            |
| 30   | 5                              | 31                                                                  | 36                                                     | 1     | ..          | ..            | ..     | 1               | 2.5      | ..          | ..                 | 2.5    | 33.5                          |
| 31   | 9                              | 35                                                                  | 44                                                     | ..    | ..          | 1             | ..     | 1               | 4.5      | ..          | .5                 | 5      | 39                            |
| 32   | 12                             | 43                                                                  | 55                                                     | ..    | ..          | ..            | ..     | ..              | 6        | ..          | ..                 | 6      | 49                            |
| 33   | 11                             | 55                                                                  | 66                                                     | ..    | ..          | ..            | ..     | ..              | 5.5      | ..          | ..                 | 5.5    | 60.5                          |
| 34   | 13                             | 66                                                                  | 79                                                     | ..    | 1           | 1             | ..     | 2               | 6.5      | .5          | .5                 | 7.5    | 71.5                          |
| 35   | 7                              | 77                                                                  | 84                                                     | 5     | ..          | ..            | ..     | 5               | 3.5      | ..          | ..                 | 3.5    | 80.5                          |
| 36   | 8                              | 79                                                                  | 87                                                     | ..    | ..          | 1             | ..     | 1               | 4        | ..          | .5                 | 4.5    | 82.5                          |
| 37   | 10                             | 86                                                                  | 96                                                     | 1     | 1           | ..            | ..     | 2               | 5        | .5          | ..                 | 5.5    | 90.5                          |
| 38   | 5                              | 94                                                                  | 99                                                     | 2     | ..          | ..            | ..     | 2               | 2.5      | ..          | ..                 | 2.5    | 96.5                          |
| 39   | 9                              | 97                                                                  | 106                                                    | 1     | ..          | ..            | 1      | 2               | 4.5      | ..          | ..                 | 4.5    | 101.5                         |
| 40   | 11                             | 104                                                                 | 115                                                    | 3     | ..          | ..            | ..     | 3               | 5.5      | ..          | ..                 | 5.5    | 109.5                         |
| 41   | 6                              | 112                                                                 | 118                                                    | 3     | ..          | 1             | ..     | 4               | 3        | ..          | ..                 | 3.5    | 114.5                         |
| 42   | 6                              | 114                                                                 | 120                                                    | 2     | ..          | 1             | ..     | 3               | 3        | ..          | .5                 | 3.5    | 116.5                         |
| 43   | 10                             | 117                                                                 | 127                                                    | 1     | ..          | 1             | ..     | 2               | 5        | ..          | .5                 | 5.5    | 121.5                         |
| 44   | 6                              | 126                                                                 | 131                                                    | 2     | ..          | 1             | ..     | 3               | 3        | ..          | .5                 | 3.5    | 127.5                         |
| 45   | 9                              | 128                                                                 | 137                                                    | 4     | ..          | ..            | ..     | 4               | 4.5      | ..          | ..                 | 4.5    | 132.5                         |
| 46   | 9                              | 133                                                                 | 142                                                    | 3     | ..          | ..            | 1      | 4               | 4.5      | ..          | ..                 | 4.5    | 137.5                         |
| 47   | 1                              | 138                                                                 | 139                                                    | 2     | ..          | ..            | ..     | 2               | .5       | ..          | ..                 | .5     | 138.5                         |
| 48   | ..                             | 137                                                                 | 137                                                    | ..    | 1           | 1             | ..     | 2               | ..       | .5          | .5                 | 1      | 136                           |
| 49   | 5                              | 135                                                                 | 140                                                    | 1     | ..          | ..            | ..     | 1               | 2.5      | ..          | ..                 | 2.5    | 137.5                         |
| 50   | ..                             | 139                                                                 | 139                                                    | 3     | ..          | ..            | ..     | 3               | ..       | ..          | ..                 | ..     | 139                           |
| 51   | 1                              | 136                                                                 | 137                                                    | 8     | ..          | ..            | 1      | 9               | .5       | ..          | ..                 | .5     | 136.5                         |
| 52   | 3                              | 128                                                                 | 131                                                    | ..    | ..          | 2             | ..     | 2               | 1.5      | ..          | 1                  | 2.5    | 128.5                         |
| 53   | 2                              | 129                                                                 | 131                                                    | 1     | ..          | ..            | 1      | 2               | 1        | ..          | ..                 | 1      | 130                           |
| 54   | 2                              | 129                                                                 | 131                                                    | 7     | ..          | 1             | ..     | 8               | 1        | ..          | .5                 | 1.5    | 129.5                         |
| 55   | ..                             | 123                                                                 | 123                                                    | 4     | 1           | 1             | ..     | 6               | ..       | .5          | .5                 | 1      | 122                           |
| 56   | 1                              | 117                                                                 | 118                                                    | 3     | ..          | 1             | ..     | 4               | .5       | ..          | .5                 | 1      | 117                           |
| 57   | 1                              | 114                                                                 | 115                                                    | 5     | ..          | ..            | ..     | 5               | .5       | ..          | ..                 | .5     | 114.5                         |
| 58   | ..                             | 110                                                                 | 110                                                    | 4     | ..          | 1             | 2      | 7               | ..       | ..          | .5                 | .5     | 109.5                         |
| 59   | 2                              | 103                                                                 | 105                                                    | 5     | 1           | ..            | 3      | 9               | 1        | .5          | ..                 | 1.5    | 103.5                         |
| 60   | 1                              | 96                                                                  | 97                                                     | 2     | ..          | 1             | 2      | 5               | .5       | ..          | .5                 | 1      | 96                            |
| 61   | ..                             | 92                                                                  | 92                                                     | 4     | ..          | 1             | 4      | 9               | ..       | ..          | .5                 | .5     | 91.5                          |
| 62   | 1                              | 83                                                                  | 84                                                     | 3     | ..          | ..            | ..     | 3               | .5       | ..          | ..                 | .5     | 83.5                          |
| 63   | ..                             | 81                                                                  | 81                                                     | 1     | 1           | ..            | 2      | 4               | ..       | .5          | ..                 | .5     | 80.5                          |
| 64   | ..                             | 77                                                                  | 77                                                     | 4     | ..          | ..            | 2      | 6               | ..       | ..          | ..                 | ..     | 77                            |
| 65   | 1                              | 71                                                                  | 72                                                     | 1     | ..          | ..            | 3      | 4               | .5       | ..          | ..                 | .5     | 71.5                          |
| 66   | ..                             | 68                                                                  | 68                                                     | 1     | ..          | 1             | 3      | 5               | ..       | ..          | .5                 | .5     | 67.5                          |
| 67   | ..                             | 63                                                                  | 63                                                     | 3     | ..          | ..            | 2      | 5               | ..       | ..          | ..                 | ..     | 63                            |
| 68   | ..                             | 58                                                                  | 58                                                     | 3     | ..          | ..            | 3      | 6               | ..       | ..          | ..                 | ..     | 58                            |
| 69   | ..                             | 52                                                                  | 52                                                     | 3     | ..          | 1             | 5      | 9               | ..       | ..          | .5                 | .5     | 51.5                          |
| 70   | ..                             | 43                                                                  | 43                                                     | 3     | ..          | ..            | 2      | 5               | ..       | ..          | ..                 | ..     | 43                            |
| 71   | ..                             | 38                                                                  | 38                                                     | 3     | 1           | 1             | 1      | 6               | ..       | .5          | .5                 | 1      | 37                            |
| 72   | ..                             | 32                                                                  | 32                                                     | 4     | ..          | 1             | 1      | 6               | ..       | ..          | .5                 | .5     | 31.5                          |
| 73   | ..                             | 26                                                                  | 26                                                     | 1     | ..          | 1             | 1      | 3               | ..       | ..          | .5                 | .5     | 25.5                          |
| 74   | 1                              | 23                                                                  | 23                                                     | 1     | ..          | ..            | ..     | 1               | .5       | ..          | ..                 | .5     | 22.5                          |
| 75   | ..                             | ..                                                                  | 23                                                     | ..    | ..          | ..            | 2      | 2               | ..       | ..          | ..                 | ..     | 23                            |
| 76   | ..                             | ..                                                                  | 21                                                     | 4     | ..          | 1             | ..     | 5               | ..       | ..          | .5                 | .5     | 20.5                          |
| 77   | ..                             | ..                                                                  | 16                                                     | 1     | ..          | ..            | ..     | 1               | ..       | ..          | ..                 | ..     | 16                            |
| 78   | ..                             | ..                                                                  | 15                                                     | 3     | ..          | ..            | 3      | 6               | ..       | ..          | ..                 | ..     | 15                            |
| 79   | ..                             | ..                                                                  | 9                                                      | 1     | ..          | ..            | 2      | 3               | ..       | ..          | ..                 | ..     | 9                             |
| 80   | ..                             | ..                                                                  | 6                                                      | ..    | ..          | ..            | 3      | 3               | ..       | ..          | ..                 | ..     | 6                             |
| 81   | ..                             | ..                                                                  | 3                                                      | ..    | ..          | ..            | 1      | 1               | ..       | ..          | ..                 | ..     | 3                             |
| 82   | ..                             | ..                                                                  | 2                                                      | 2     | ..          | ..            | ..     | 2               | ..       | ..          | ..                 | ..     | 2                             |
| 83   | ..                             | ..                                                                  | ..                                                     | ..    | ..          | ..            | ..     | ..              | ..       | ..          | ..                 | ..     | ..                            |
| 84   | ..                             | ..                                                                  | ..                                                     | ..    | ..          | ..            | ..     | ..              | ..       | ..          | ..                 | ..     | ..                            |
| 85   | ..                             | ..                                                                  | ..                                                     | ..    | ..          | ..            | ..     | ..              | ..       | ..          | ..                 | ..     | ..                            |
|      | 202                            | ..                                                                  | 4,407                                                  | 120   | 7           | 24            | 51     | 202             | 101.0    | 3.5         | 12.0               | 116.5  | 4290.5                        |



The following Abstract will make the contents of Table II better understood.

ABSTRACT B.

| Ages.       | Number Exposed to Risk. | Died. | Mortality per Cent. |
|-------------|-------------------------|-------|---------------------|
| 25 to 29    | 84.0                    | 1     | 1.190               |
| 30 ... 34   | 253.5                   | 1     | .395                |
| 35 ... 39   | 451.5                   | 9     | 1.993               |
| 40 ... 44   | 589.5                   | 11    | 1.866               |
| 45 ... 49   | 682.0                   | 10    | 1.466               |
| 50 ... 54   | 663.5                   | 19    | 2.863               |
| 55 ... 59   | 566.5                   | 21    | 3.823               |
| 60 ... 64   | 428.5                   | 14    | 3.267               |
| 65 ... 69   | 311.5                   | 11    | 3.531               |
| 70 ... 74   | 159.5                   | 12    | 7.524               |
| 75 ... 79   | 83.5                    | 9     | 10.778              |
| 80 ... 84   | 11.0                    | 2     | 18.181              |
| Total ..... | 4284.5                  | 120   | 2.801               |

It is thus found that while the collected results for the preceding Abstract shew a somewhat higher mortality than that in Abstract A, there is still a great dissimilarity at the different periods of life. The mortality, as given in Abstract B, which represents the deaths among such members as entered the Society when married, being more in accordance with the results derived from observations on other classes of society, exhibiting an increasing rate of mortality as life advances, and pretty uniformly exceeding that for England and Wales; the few irregularities may be fairly supposed to arise from the fluctuations due to the comparatively small number of facts over which the observations recorded in Abstract B extend.

In order to compare the results in this Abstract with those already furnished in Abstract A, it will be sufficient to give the rate of mortality within the periods of 25-54 and 55-84.

| Ages.     | Mortality per Cent. among those Members who entered the Society |                      |
|-----------|-----------------------------------------------------------------|----------------------|
|           | Unmarried, Abstract A.                                          | Married, Abstract B. |
| 25 to 54  | 2.386                                                           | 1.872                |
| 55 ... 84 | 2.922                                                           | 4.422                |

This Abstract affords abundant evidence in support of the conclusion that there is some circumstance connected with the mode or condition of life in which the members of the two classes were placed, having a marked influence on their health and longevity. It is, however, unnecessary to dwell longer on the difference between the preceding two classes, for it is obvious that, in Abstract A, which includes the group entering the Society while unmarried, many of them must have married subsequent to the date of entry, and therefore the results do not afford a proper comparison between the mortality incidental to the conditions of married and single life; another analysis has, therefore, been made to shew the results peculiar to those conditions.

[The first



TABLE III.

*Mortality among Members entering Single, and remaining under Observation whilst Single only.*

| Age. | Number Entered at each Age. | Number remaining under Observation from Age preceding. | Total Number under Observation at each Age. | Died. | Struck off. | Discontinued. | Married. | Alive. | Total gone off. | Half of  |             |               |          | Total. | Number Exposed to Risk. |
|------|-----------------------------|--------------------------------------------------------|---------------------------------------------|-------|-------------|---------------|----------|--------|-----------------|----------|-------------|---------------|----------|--------|-------------------------|
|      |                             |                                                        |                                             |       |             |               |          |        |                 | Entered. | Struck off. | Discontinued. | Married. |        |                         |
| 17   | 3                           | ..                                                     | 3                                           | ..    | ..          | ..            | ..       | ..     | ..              | 1.5      | ..          | ..            | ..       | 1.5    | 1.5                     |
| 18   | 1                           | 3                                                      | 4                                           | ..    | ..          | ..            | ..       | ..     | ..              | .5       | ..          | ..            | ..       | .5     | 3.5                     |
| 19   | 2                           | 4                                                      | 6                                           | ..    | ..          | ..            | ..       | ..     | ..              | 1        | ..          | ..            | ..       | 1      | 5                       |
| 20   | 21                          | 6                                                      | 27                                          | 2     | ..          | ..            | ..       | ..     | 2               | 10.5     | ..          | ..            | ..       | 10.5   | 16.5                    |
| 21   | 99                          | 25                                                     | 124                                         | 9     | ..          | 3             | ..       | ..     | 12              | 49.5     | ..          | 1.5           | ..       | 51     | 73                      |
| 22   | 141                         | 112                                                    | 253                                         | 12    | 7           | 4             | 1        | 5      | 29              | 70.5     | 3.5         | 2             | .5       | 76.5   | 176.5                   |
| 23   | 195                         | 224                                                    | 419                                         | 17    | 6           | 12            | 3        | 14     | 52              | 97.5     | 3           | 6             | 1.5      | 108    | 311                     |
| 24   | 153                         | 367                                                    | 520                                         | 11    | 9           | 8             | 2        | 11     | 41              | 76.5     | 4.5         | 4             | 1        | 86     | 434                     |
| 25   | 168                         | 479                                                    | 647                                         | 25    | 15          | 12            | 5        | 25     | 82              | 84       | 7.5         | 6             | 2.5      | 100    | 547                     |
| 26   | 133                         | 565                                                    | 698                                         | 25    | 19          | 23            | 6        | 24     | 97              | 66.5     | 9.5         | 11.5          | 3        | 90.5   | 607.5                   |
| 27   | 62                          | 601                                                    | 663                                         | 10    | 15          | 15            | 9        | 25     | 74              | 31       | 7.5         | 7.5           | 4.5      | 50.5   | 612.5                   |
| 28   | 41                          | 589                                                    | 630                                         | 12    | 19          | 12            | 12       | 24     | 79              | 20.5     | 9.5         | 6             | 6        | 42     | 588                     |
| 29   | 32                          | 551                                                    | 583                                         | 13    | 12          | 10            | 12       | 20     | 67              | 16       | 6           | 5             | 6        | 33     | 550                     |
| 30   | 17                          | 516                                                    | 533                                         | 9     | 12          | 11            | 20       | 20     | 72              | 8.5      | 6           | 5.5           | 10       | 30     | 503                     |
| 31   | 31                          | 461                                                    | 492                                         | 10    | 5           | 10            | 17       | 24     | 66              | 15.5     | 2.5         | 5             | 8.5      | 31.5   | 460.5                   |
| 32   | 32                          | 426                                                    | 458                                         | 16    | 6           | 4             | 16       | 26     | 68              | 16       | 3           | 2             | 8        | 29     | 429                     |
| 33   | 24                          | 390                                                    | 414                                         | 12    | 2           | 2             | 16       | 18     | 50              | 12       | 1           | 1             | 8        | 22     | 392                     |
| 34   | 28                          | 364                                                    | 392                                         | 8     | 5           | 7             | 12       | 17     | 49              | 14       | 2.5         | 3.5           | 6        | 26     | 366                     |
| 35   | 25                          | 343                                                    | 368                                         | 8     | 2           | 4             | 10       | 11     | 35              | 12.5     | 1           | 2             | 5        | 20.5   | 347.5                   |
| 36   | 19                          | 333                                                    | 352                                         | 7     | 3           | 3             | 12       | 15     | 40              | 9.5      | 1.5         | 1.5           | 6        | 18.5   | 333.5                   |
| 37   | 13                          | 312                                                    | 325                                         | 11    | 3           | 7             | 7        | 10     | 38              | 6.5      | 1.5         | 3.5           | 3.5      | 15     | 310                     |
| 38   | 12                          | 287                                                    | 299                                         | 6     | ..          | 4             | 17       | 6      | 33              | 6        | ..          | 2             | 8.5      | 16.5   | 282.5                   |
| 39   | 20                          | 266                                                    | 286                                         | 1     | 2           | 4             | 7        | 6      | 20              | 10       | 1           | 2             | 3.5      | 16.5   | 269.5                   |
| 40   | 14                          | 266                                                    | 280                                         | 8     | 1           | 4             | 6        | 4      | 23              | 7        | .5          | 2             | 3        | 12.5   | 267.5                   |
| 41   | 9                           | 257                                                    | 266                                         | 13    | 3           | 7             | 3        | 8      | 34              | 4.5      | 1.5         | 3.5           | 1.5      | 11     | 255                     |
| 42   | 9                           | 232                                                    | 241                                         | 9     | 1           | 7             | 6        | 2      | 25              | 4.5      | .5          | 3.5           | 3        | 11.5   | 229.5                   |
| 43   | 3                           | 216                                                    | 219                                         | 4     | ..          | 6             | 6        | 1      | 17              | 1.5      | ..          | 3             | 3        | 7.5    | 211.5                   |
| 44   | 6                           | 202                                                    | 208                                         | 2     | 1           | 5             | 7        | 3      | 18              | 3        | .5          | 2.5           | 3.5      | 9.5    | 198.5                   |
| 45   | 6                           | 190                                                    | 196                                         | 3     | 2           | 3             | 4        | 2      | 14              | 3        | 1           | 1.5           | 2        | 7.5    | 188.5                   |
| 46   | 3                           | 182                                                    | 185                                         | 3     | 1           | 2             | 3        | 3      | 12              | 1.5      | .5          | 1             | 1.5      | 4.5    | 180.5                   |
| 47   | 4                           | 173                                                    | 177                                         | 2     | 1           | 1             | 2        | 2      | 8               | 2        | .5          | .5            | 1        | 4      | 173                     |
| 48   | 3                           | 169                                                    | 172                                         | 1     | ..          | 7             | 3        | 5      | 16              | 1.5      | ..          | 3.5           | 1.5      | 6.5    | 165.5                   |
| 49   | ..                          | 156                                                    | 156                                         | 2     | ..          | 4             | 7        | 3      | 16              | ..       | ..          | 2             | 3.5      | 5.5    | 150.5                   |
| 50   | ..                          | 140                                                    | 140                                         | 3     | ..          | 1             | 2        | 2      | 8               | ..       | ..          | .5            | 1        | 1.5    | 138.5                   |
| 51   | 2                           | 132                                                    | 134                                         | 4     | 2           | 2             | 3        | 2      | 13              | 1        | 1           | 1             | 1.5      | 4.5    | 129.5                   |
| 52   | ..                          | 121                                                    | 121                                         | 1     | ..          | 3             | 2        | 1      | 7               | ..       | ..          | 1.5           | 1        | 2.5    | 118.5                   |
| 53   | ..                          | 114                                                    | 114                                         | 1     | ..          | 2             | 5        | 2      | 10              | ..       | ..          | 1             | 2.5      | 3.5    | 110.5                   |
| 54   | 3                           | 104                                                    | 107                                         | 7     | ..          | 1             | 1        | 3      | 12              | 1.5      | ..          | .5            | .5       | 2.5    | 104.5                   |
| 55   | 2                           | 95                                                     | 97                                          | 2     | ..          | 1             | 1        | 2      | 6               | 1        | ..          | .5            | .5       | 2      | 95                      |
| 56   | ..                          | 91                                                     | 91                                          | 2     | 4           | 1             | 2        | 4      | 13              | ..       | 2           | .5            | 1        | 3.5    | 87.5                    |
| 57   | 1                           | 78                                                     | 79                                          | ..    | ..          | 2             | ..       | 1      | 3               | .5       | ..          | 1             | ..       | 1.5    | 77.5                    |
| 58   | ..                          | 76                                                     | 76                                          | 3     | 2           | 6             | ..       | 2      | 13              | ..       | 1           | 3             | ..       | 4      | 72                      |
| 59   | 1                           | 63                                                     | 64                                          | ..    | ..          | 2             | 2        | 3      | 7               | .5       | ..          | 1             | 1        | 2.5    | 61.5                    |
| 60   | ..                          | 57                                                     | 57                                          | ..    | ..          | 1             | ..       | 5      | 6               | ..       | ..          | .5            | ..       | .5     | 56.5                    |
| 61   | ..                          | 51                                                     | 51                                          | ..    | 1           | ..            | ..       | 2      | 3               | ..       | .5          | ..            | ..       | .5     | 50.5                    |
| 62   | ..                          | 48                                                     | 48                                          | 1     | ..          | ..            | ..       | 4      | 5               | ..       | ..          | ..            | ..       | ..     | 48                      |
| 63   | ..                          | 43                                                     | 43                                          | 2     | ..          | 2             | ..       | 1      | 5               | ..       | ..          | 1             | ..       | 1      | 42                      |
| 64   | ..                          | 38                                                     | 38                                          | ..    | ..          | 2             | ..       | 1      | 3               | ..       | ..          | 1             | ..       | 1      | 37                      |
| 65   | 1                           | 35                                                     | 36                                          | 2     | 2           | ..            | ..       | 2      | 6               | .5       | 1           | ..            | ..       | 1.5    | 34.5                    |
| 66   | 1                           | 30                                                     | 31                                          | ..    | 1           | ..            | ..       | 2      | 3               | .5       | .5          | ..            | ..       | 1      | 30                      |
| 67   | ..                          | ..                                                     | 28                                          | ..    | ..          | ..            | ..       | 4      | 4               | ..       | ..          | ..            | ..       | ..     | 28                      |
| 68   | ..                          | ..                                                     | 24                                          | ..    | 1           | ..            | ..       | 1      | 2               | ..       | .5          | ..            | ..       | .5     | 23.5                    |
| 69   | ..                          | ..                                                     | 22                                          | ..    | ..          | ..            | ..       | 1      | 1               | ..       | ..          | ..            | ..       | ..     | 22                      |
| 70   | ..                          | ..                                                     | 21                                          | 1     | ..          | ..            | ..       | 2      | 3               | ..       | ..          | ..            | ..       | ..     | 21                      |
| 71   | ..                          | ..                                                     | 18                                          | ..    | ..          | ..            | ..       | 1      | 1               | ..       | ..          | ..            | ..       | ..     | 18                      |
| 72   | ..                          | ..                                                     | 17                                          | 1     | ..          | ..            | ..       | 2      | 3               | ..       | ..          | ..            | ..       | ..     | 17                      |
| 73   | ..                          | ..                                                     | 14                                          | 1     | ..          | ..            | ..       | 1      | 2               | ..       | ..          | ..            | ..       | ..     | 14                      |
| 74   | ..                          | ..                                                     | 12                                          | ..    | ..          | 1             | ..       | 2      | 3               | ..       | ..          | .5            | ..       | .5     | 11.5                    |
| 75   | ..                          | ..                                                     | 9                                           | ..    | ..          | ..            | ..       | 1      | 1               | ..       | ..          | ..            | ..       | ..     | 9                       |
| 76   | ..                          | ..                                                     | 8                                           | ..    | ..          | ..            | ..       | 1      | 1               | ..       | ..          | ..            | ..       | ..     | 8                       |
| 77   | ..                          | ..                                                     | 7                                           | 1     | ..          | ..            | ..       | 2      | 3               | ..       | ..          | ..            | ..       | ..     | 7                       |
| 78   | ..                          | ..                                                     | 4                                           | 1     | ..          | ..            | ..       | ..     | 1               | ..       | ..          | ..            | ..       | ..     | 4                       |
| 79   | ..                          | ..                                                     | 3                                           | ..    | ..          | ..            | ..       | 1      | 1               | ..       | ..          | ..            | ..       | ..     | 3                       |
| 80   | ..                          | ..                                                     | 2                                           | ..    | ..          | ..            | ..       | 1      | 1               | ..       | ..          | ..            | ..       | ..     | 2                       |
| 81   | ..                          | ..                                                     | 1                                           | ..    | ..          | ..            | ..       | 1      | 1               | ..       | ..          | ..            | ..       | ..     | 1                       |
| 82   | ..                          | ..                                                     | ..                                          | ..    | ..          | ..            | ..       | ..     | ..              | ..       | ..          | ..            | ..       | ..     | ..                      |
| 83   | ..                          | ..                                                     | ..                                          | ..    | ..          | ..            | ..       | ..     | ..              | ..       | ..          | ..            | ..       | ..     | ..                      |
| 84   | ..                          | ..                                                     | ..                                          | ..    | ..          | ..            | ..       | ..     | ..              | ..       | ..          | ..            | ..       | ..     | ..                      |
| 85   | ..                          | ..                                                     | ..                                          | ..    | ..          | ..            | ..       | ..     | ..              | ..       | ..          | ..            | ..       | ..     | ..                      |
|      | 1,340                       | ..                                                     | 12,113                                      | 304   | 165         | 228           | 249      | 394    | 1,340           | 670.0    | 82.5        | 114.0         | 124.5    | 991.0  | 11139.0                 |



The first part of the inquiry, made to shew the results connected with the mortality of single life, will be found set forth in the preceding Table, which contains all the facts bearing on the rate of mortality among such members as entered the Society in the single condition, and the observations extending over the period while they remained single. In the event of any member becoming married, all further observation ceases.

The following Abstract C, shews the results arrived at in Table III.

ABSTRACT C.

| Ages.     | Number Exposed to Risk. | Died. | Mortality per Cent. |
|-----------|-------------------------|-------|---------------------|
| 20 to 24  | 1011.0                  | 51    | 5.045               |
| 25 ... 29 | 2905.0                  | 85    | 2.926               |
| 30 ... 34 | 2150.5                  | 55    | 2.558               |
| 35 ... 39 | 1543.0                  | 33    | 2.138               |
| 40 ... 44 | 1162.0                  | 36    | 3.099               |
| 45 ... 49 | 858.0                   | 11    | 1.282               |
| 50 ... 54 | 601.5                   | 16    | 2.660               |
| 55 ... 59 | 393.5                   | 7     | 1.779               |
| 60 ... 64 | 234.0                   | 3     | 1.282               |
| 65 ... 69 | 138.0                   | 2     | 1.449               |
| 70 ... 74 | 81.5                    | 3     | 3.681               |
| 75 ... 79 | 31.0                    | 2     | 6.451               |
| 80 ... 84 | 3.0                     | ...   | ...                 |
| Total...  | 11112.0                 | 304   | 2.736               |

This Abstract shews that the results characteristic of Abstract A are still more strongly developed here; the mortality of early life being higher, that of advanced life lower, and the general mortality even being higher than that of Abstract A. It would hence follow that the elimination of the cases of those who subsequently married has the effect of increasing the general mortality for the residue, as well as increasing the mortality at the early ages and diminishing it at the advanced periods of life. This will be more clearly seen by an inspection of the following figures:—

| Ages.     | Mortality per Cent.<br>among all those who entered<br>Single.<br>Abstract A. | Mortality per Cent.<br>of those who entered<br>Single,<br>but were excluded from<br>further observation after<br>becoming Married.<br>Abstract C. |
|-----------|------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 20 to 54  | 2.593                                                                        | 2.805                                                                                                                                             |
| 55 ... 84 | 2.922                                                                        | 1.918                                                                                                                                             |
| 20 ... 84 | 2.632                                                                        | 2.736                                                                                                                                             |



It is hence evident that the vicissitudes of unmarried life have a more powerful influence on mortality under the age of 55 than above it, compared with the causes connected with the married condition; and further evidence of this will be derived from the following two Abstracts.

In the next Abstract are included such facts only as constitute the complement of Table III, that is, the observations connected with those who have entered the Society while single, but who afterwards married,—the observations commencing from the date of marriage; and therefore the facts in Table III and the following Abstract, constitute the whole of those given in Table I. It has already been shewn that the aggregate mortality of Table III exceeds that of Table I, and therefore the mortality of the next Abstract must fall under that of Table I; but it has also been shewn that the mortality of Table III has, in an eminent degree, portrayed the features characteristic of Table I, and, consequently, Abstract D, following, must be expected to be more uniform, and approximate more nearly to the rate of mortality prevailing in Table II.

#### ABSTRACT D.

*Mortality of those who entered Single, but afterwards Married; the observations commencing at Marriage.*

| Ages.     | Number Exposed to Risk. | Died. | Mortality per Cent. |
|-----------|-------------------------|-------|---------------------|
| 20 to 24  | 5.5                     | ...   | ...                 |
| 25 ... 29 | 100.0                   | 3     | 3.000               |
| 30 ... 34 | 347.5                   | 5     | 1.439               |
| 35 ... 39 | 521.0                   | 8     | 1.536               |
| 40 ... 44 | 602.5                   | 3     | 1.328               |
| 45 ... 49 | 589.0                   | 13    | 2.207               |
| 50 ... 54 | 523.0                   | 11    | 2.103               |
| 55 ... 59 | 440.0                   | 12    | 2.727               |
| 60 ... 64 | 249.5                   | 9     | 3.607               |
| 65 ... 69 | 121.0                   | 6     | 4.959               |
| 70 ... 74 | 41.5                    | 5     | 12.048              |
| 75 ... 79 | 11.5                    | 1     | 8.070               |
| 80 ... 84 | 1.0                     | 1     | 100.000             |
| Total...  | 3553.3                  | 82    | 2.308               |

The following shews the condensed results of this Abstract:—

Mortality from ages 20 to 54 = 1.785 per cent.

... .. 55 ... 84 = 3.944 ...

... .. 20 ... 84 = 2.308 ...



Table III, preceding, shewed the rate of mortality among such members as entered single, during the period they continued so, all further observations ceasing after marriage. In the next Abstract will be set forth the rate of mortality among the married members; and it will embrace all the facts of those who entered married, as given in Table II, as well as of those who entered single but afterwards married, the observations commencing at the date of marriage, the facts of which are contained in Abstract D.

#### ABSTRACT E.

*Mortality among Members entered Married, and entered Single but afterwards Married; the Single coming under observation at Marriage.*

| Ages.     | Number Exposed to Risk. | Died. | Mortality per Cent. |
|-----------|-------------------------|-------|---------------------|
| 25 to 29  | 184.0                   | 4     | 2.174               |
| 30 ... 34 | 601.0                   | 6     | .998                |
| 35 ... 39 | 972.5                   | 17    | 1.748               |
| 40 ... 44 | 1192.0                  | 19    | 1.594               |
| 45 ... 49 | 1271.0                  | 23    | 1.810               |
| 50 ... 54 | 1186.5                  | 30    | 2.529               |
| 55 ... 59 | 1006.5                  | 33    | 3.279               |
| 60 ... 64 | 678.0                   | 23    | 3.392               |
| 65 ... 69 | 432.5                   | 17    | 3.931               |
| 70 ... 74 | 201.0                   | 17    | 8.458               |
| 75 ... 79 | 95.0                    | 10    | 10.526              |
| 80 ... 84 | 12.0                    | 3     | 25.000              |
| Total ... | 7832.0                  | 202   | 2.580               |

In this Abstract the following will be found to represent the general results arrived at:—

Mortality from ages 25—54 = 1.831 per cent.

... .. 55—84 = 4.247 ...

... .. 25—84 = 2.580 ...

The results of this Abstract, as compared with those of Table III and Abstract C, are interesting, as shewing the distinction between the mortality of married and single life. The following gives a condensed illustration of the difference of mortality:—

| Ages.     | Mortality per Cent. among the Married and Single Members of the Society. |                                 |
|-----------|--------------------------------------------------------------------------|---------------------------------|
|           | Single Members.<br>Abstract C.                                           | Married Members.<br>Abstract E. |
| 25 to 54  | 2.559                                                                    | 1.831                           |
| 55 ... 84 | 1.918                                                                    | 4.247                           |
| 25 ... 84 | 2.504                                                                    | 2.580                           |



In this, as in the preceding instances, it is obvious that the characteristic of the mortality of single life is still maintained, the rate of mortality among the unmarried members being greater at the earlier ages, and less at those ages more advanced.

Having thus exhibited the rate of mortality for each of the preceding groups and combinations, it may be now useful to shew the results for the combined experience of all the members, whether married or single. The following Abstract F shews, for each quinquennial term of life, the rate of mortality among all the members of the Society from its establishment in 1816, till the 1st of January, 1851.

## ABSTRACT F.

*Mortality among all the Members, Married and Single.*

| Ages.     | Number Exposed to Risk. | Died. | Mortality per Cent. |
|-----------|-------------------------|-------|---------------------|
| 20 to 24  | 1016.5                  | 51    | 5.017               |
| 25 ... 29 | 3089.0                  | 89    | 2.881               |
| 30 ... 34 | 2751.5                  | 61    | 2.217               |
| 35 ... 39 | 2515.5                  | 50    | 1.988               |
| 40 ... 44 | 2354.0                  | 55    | 2.336               |
| 45 ... 49 | 2129.0                  | 34    | 1.597               |
| 50 ... 54 | 1788.0                  | 46    | 2.573               |
| 55 ... 59 | 1400.0                  | 40    | 2.857               |
| 60 ... 64 | 912.0                   | 26    | 2.850               |
| 65 ... 69 | 570.5                   | 19    | 3.330               |
| 70 ... 74 | 282.5                   | 20    | 7.080               |
| 75 ... 79 | 126.0                   | 12    | 9.524               |
| 80 ... 84 | 15.0                    | 3     | 20.000              |
| Total...  | 18949.5                 | 506   | 2.670               |

The condensed results are as follows:—

Mortality between ages 20 to 54 = 2.467 per cent.

... 55 ... 84 = 3.629 ...

... 20 ... 84 = 2.670 ...

The next Abstract will give a succinct view of the results set forth in each of the preceding six Abstracts, as well as the general mortality at the corresponding ages for the male population of England and Wales, as given in the earlier part of this Volume, pages 4 and 6.



## ABSTRACT G.

| Ages.     | Mortality per Cent.   |                        |                                                                     |                                                                                        |                                                                                                |                                            | Male Population of England and Wales. |
|-----------|-----------------------|------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------|---------------------------------------|
|           | Entered Single.<br>A. | Entered Married.<br>B. | Entered Single, and remaining under observation while Single.<br>C. | Entered Single, but afterwards Married; the observations commencing at Marriage.<br>D. | Entered Married and entered Single; but the Single coming under observation at Marriage.<br>E. | All the Members, Married and Single.<br>F. |                                       |
| 20 to 24  | 5.017                 | ...                    | 5.045                                                               | ...                                                                                    | ...                                                                                            | 5.017                                      | .845                                  |
| 25 ... 29 | 2.928                 | 1.190                  | 2.926                                                               | 3.000                                                                                  | 2.174                                                                                          | 2.881                                      | .981                                  |
| 30 ... 34 | 2.402                 | .395                   | 2.558                                                               | 1.439                                                                                  | .998                                                                                           | 2.217                                      | 1.049                                 |
| 35 ... 39 | 1.986                 | 1.993                  | 2.138                                                               | 1.536                                                                                  | 1.748                                                                                          | 1.988                                      | 1.134                                 |
| 40 ... 44 | 2.494                 | 1.866                  | 3.099                                                               | 1.328                                                                                  | 1.594                                                                                          | 2.336                                      | 1.279                                 |
| 45 ... 49 | 1.660                 | 1.466                  | 1.282                                                               | 2.207                                                                                  | 1.820                                                                                          | 1.597                                      | 1.506                                 |
| 50 ... 54 | 2.401                 | 2.863                  | 2.660                                                               | 2.103                                                                                  | 2.529                                                                                          | 2.573                                      | 1.842                                 |
| 55 ... 59 | 2.280                 | 3.823                  | 1.779                                                               | 2.727                                                                                  | 3.279                                                                                          | 2.857                                      | 2.393                                 |
| 60 ... 64 | 2.482                 | 3.267                  | 1.282                                                               | 3.607                                                                                  | 3.392                                                                                          | 2.850                                      | 3.242                                 |
| 65 ... 69 | 3.089                 | 3.531                  | 1.449                                                               | 4.959                                                                                  | 3.931                                                                                          | 3.330                                      | 4.608                                 |
| 70 ... 74 | 6.553                 | 7.524                  | 3.681                                                               | 12.048                                                                                 | 8.408                                                                                          | 7.080                                      | 6.686                                 |
| 75 ... 79 | 7.059                 | 10.778                 | 6.451                                                               | 8.700                                                                                  | 10.526                                                                                         | 9.528                                      | 10.041                                |
| 80 ... 84 | 25.000                | 18.181                 | ...                                                                 | 100.000                                                                                | 25.000                                                                                         | 20.000                                     | 15.055                                |
| Total...  | 2.632                 | 2.801                  | 2.736                                                               | 2.308                                                                                  | 2.580                                                                                          | 2.670                                      | 2.025                                 |

The following gives a condensed view of the results arrived at for each of the preceding groups or classes:—

| Groups or Classes.                                      | Mortality per Cent. between |             |             |
|---------------------------------------------------------|-----------------------------|-------------|-------------|
|                                                         | Ages 25—54.                 | Ages 55—84. | Ages 25—84. |
| Abstract A.—Entered single .....                        | 2.386                       | 2.922       | 2.454       |
| ... B.—Entered married .....                            | 1.872                       | 4.422       | 2.801       |
| ... C.—Members of Abstract A during unmarried state...  | 2.559                       | 1.918       | 2.504       |
| ... D.—Members of Abstract A during married state ..... | 1.789                       | 3.944       | 2.312       |
| ... E.—Married members .....                            | 1.831                       | 4.247       | 2.580       |
| ... F.—Both single and married members .....            | 2.290                       | 3.629       | 2.537       |
| Male population of England and Wales.....               | 1.166                       | 5.056       | 1.918       |

As already stated, each Abstract gives the data and correct rate of mortality for each quinquennial period of life; and the above condensed form of exhibiting the mortality per cent. may, for general purposes, be considered sufficient to illustrate the relative bearing of the different groups; but, at the same time, it is necessary to exercise caution against the employment of those figures or others similarly derived, and extending over any considerable term of life, as giving an exact expression of the true mortality among the different classes compared. The true mortality can only be collected from the details



of each of the preceding Tables, or from the rate of mortality given for each quinquennium in the corresponding Abstracts A, B, C, D, E, and F. The nature of the error contained in the condensed illustrations will be found explained in page 44 *ante*. The conditions necessary to the correct comparison of results derived from observations extending over a considerable term of life, such as between ages 25-54, 55-84, and 25-84, or any other extended periods of life are, that the relative numbers of persons over which the observations are made at the different periods of life should be in exact proportion to each other in the different groups of observations; but should there be in any one group an undue proportion of persons at the younger or older ages, the resulting rate of mortality will become modified accordingly, even although out of equal numbers in each group at different ages the same number of deaths would take place in the same time. Inattention to the errors inherent in such illustrations has often led inquirers to very false conclusions; the method is, however, useful, if employed only for general purposes, and with proper caution. The following figures exhibit the number of years' risk observed on at each term of life.

| GROUPS.                                                         | Number of Years' Observation at the Term of Life. |                      |           |                      |
|-----------------------------------------------------------------|---------------------------------------------------|----------------------|-----------|----------------------|
|                                                                 | 25 to 54.                                         | Proportion per Cent. | 55 to 84. | Proportion per Cent. |
| Abstract A.—Entered single.....                                 | 11903·0                                           | 87·1                 | 1745·5    | 12·9                 |
| ... B.—Entered married .....                                    | 2724·0                                            | 63·5                 | 1560·5    | 36·5                 |
| ... C.—Members of Abstract A during <i>un</i> married state ... | 9220·0                                            | 91·3                 | 881·0     | 8·7                  |
| ... D.—Members of Abstract A during married state .....         | 2683·0                                            | 75·6                 | 864·5     | 24·4                 |
| ... E.—Married members .....                                    | 5407·0                                            | 69·0                 | 2425·0    | 31·0                 |
| ... F.—Both single and married members .....                    | 14627·0                                           | 81·6                 | 3306·0    | 18·4                 |

It is evident that in some of the above groups there is very great irregularity in the distribution of the number of facts, or years of risk observed at different ages, and hence the rate of mortality per cent. derived from these collected or aggravated results, and which must necessarily be a mean of such irregularly distributed facts, cannot be relied on as shewing the correct relation of the causes of mortality pressing on each class of observations. These remarks apply with greater force to the comparison of the results for the aggregate of all ages, than to the comparative results for either of the extended terms of life, 25-54, or 55-84. It will be seen that in Group C, 91·3 per cent. of the facts are contained between ages 25-54, but in Group B there is only 63·5 per cent. of the observations of that group made between the same ages.

There is another method, however, by which the aggregate mortality of the combined ages may be compared without any error, and that is by comparing the actual number of deaths which has taken place, in each class or group, with that which would have taken place if the rate of mortality had prevailed at each term of life in each group,



which is known to correctly represent the mortality at the same terms of life in any given standard table of mortality with which the results of each group may be compared.

The following shews the number of deaths which have actually taken place in each group, and the number which would have taken place had the same rate of mortality prevailed which is known to represent the mortality of the male population of this country.

## ABSTRACT H.

| Groups.     |                                                        | Difference between the Mortality which has actually taken place and that which would have happened, according to the ratio for the Male Population of England and Wales, between the following Ages : |                    |                      |         |                    |                      |         |                    |                      |
|-------------|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------|---------|--------------------|----------------------|---------|--------------------|----------------------|
|             |                                                        | 20—54.                                                                                                                                                                                                |                    |                      | 55—84.  |                    |                      | 20—84.  |                    |                      |
|             |                                                        | Actual.                                                                                                                                                                                               | England and Wales. | Difference per Cent. | Actual. | England and Wales. | Difference per Cent. | Actual. | England and Wales. | Difference per Cent. |
| Abstract A. | Entered Single .....                                   | 335                                                                                                                                                                                                   | 151·8              | + 120                | 51      | 59·5               | — 15                 | 386     | 211·3              | + 83                 |
| „           | B. Entered Married .....                               | 51                                                                                                                                                                                                    | 38·5               | + 34                 | 69      | 62·1               | + 11                 | 120     | 100·6              | + 20                 |
| „           | C. Members of Abstract A }<br>during unmarried state } | 287                                                                                                                                                                                                   | 116·0              | + 147                | 17      | 32·3               | — 47                 | 304     | 148·3              | + 101                |
| „           | D. Members of Abstract A }<br>during married state.. } | 48                                                                                                                                                                                                    | 35·8               | + 33                 | 34      | 27·2               | + 26                 | 82      | 63·0               | + 30                 |
| „           | E. Married Members .....                               | 99                                                                                                                                                                                                    | 74·3               | + 33                 | 103     | 89·3               | + 15                 | 202     | 163·6              | + 24                 |
| „           | F. Both Married and Single }<br>Members .....          | 386                                                                                                                                                                                                   | 190·3              | + 113                | 120     | 121·6              | — 1                  | 506     | 211·9              | + 62                 |

An examination of the above results only confirms the conclusions formerly arrived at; namely, that the members taken in the aggregate under the age of 55 are subject to an unprecedented amount of mortality, but that subsequent to that age the rate of mortality does not differ widely from that of the population generally: as may be more apparent from the following figures taken from the preceding abstract:—

|                                              | Actual. | England and Wales. |
|----------------------------------------------|---------|--------------------|
| Number of deaths between the ages 20 to 54 = | 386     | 190·3              |
| ... .. 55 ... 84 =                           | 120     | 121·6              |
| ... .. 20 ... 84 =                           | 506     | 311·9              |

It is also evident, from the results of the preceding abstract, as well as from those formerly brought under consideration, that the mortality in Group E, which represents the married members, differs very widely from that in Group C, which represents the unmarried.

| Period of Life.    | Difference per Cent. between the Actual Mortality and that of England and Wales among the |                |
|--------------------|-------------------------------------------------------------------------------------------|----------------|
|                    | Unmarried Group.                                                                          | Married Group. |
| Between Ages 20—54 | + 147 per Cent.                                                                           | + 33 per Cent. |
| ... .. 55—84       | — 47 ...                                                                                  | + 15 ...       |
| ... .. 20—84       | + 101 ...                                                                                 | + 24 ...       |



It is thus abundantly evident that the rate of mortality of the married members is so very different from that of the single, that in any calculations intended to measure the duration of life among the married members only, it would not be proper to include the mortality of the single members.

The following Table is formed from the data given in Abstract E, preceding, and represents the mortality for the mean of each quinquennial term of life among the married members of the Society. For a detailed explanation of the principles on which Tables IV and V are constructed, see the subsequent portion of these contributions on the mortality among persons of intemperate habits.

TABLE IV.

*Married Members. Interpolation of Mortality per Cent.*

(1) Original Quantities.

$\Delta_1$  and  $\Delta_2$  = 1st and 2nd Differences.

$a = .2 \Delta_1$

$b = .04 \Delta_2$

| Age. | (1.)   | $\Delta_1$    | $\Delta_2$     |
|------|--------|---------------|----------------|
| 27   | 2.174  | — 1.176       | + 1.926        |
|      |        | — .2352 = $a$ | + .07704 = $b$ |
| 32   | .998   | + .750        | — .904         |
|      |        | + .1500       | — .03616       |
| 37   | 1.748  | — .154        | + .370         |
|      |        | — .0308       | + .01480       |
| 42   | 1.594  | + .216        | .503           |
|      |        | + .0432       | .02012         |
| 47   | 1.810  | .719          | + .031         |
|      |        | .1438         | + .00124       |
| 52   | 2.529  | .750          | — .637         |
|      |        | .1500         | — .02548       |
| 57   | 3.279  | .113          | + .426         |
|      |        | .0226         | + .01704       |
| 62   | 3.392  | .539          | + 3.988        |
|      |        | .1078         | + .15952       |
| 67   | 3.931  | 4.527         | — 2.459        |
|      |        | .9054         | — .09836       |
| 72   | 8.458  | 2.068         | + 12.406       |
|      |        | .4136         | + .49624       |
| 77   | 10.526 | + 14.474      |                |
|      |        | + 2.8948      |                |
| 82   | 25.000 |               |                |

The next Table, viewed in connection with the preceding one, shews the mode by which the intermediate terms are determined and interpolated between the original quantities given in Abstract E. For an explanation, more in detail, of the construction of the preceding and the two following Tables, see the subsequent portion of this paper on the "Mortality of Master Mariners."



TABLE V.

*Married Members. Interpolation of Mortality per Cent.*

$$\text{Interval} = \frac{1}{5}$$

(1) = Original Quantities.

$$1\text{st } \delta_1 = a - 2b.$$

$$\delta_2 = b.$$

| Age. | (1.)         | $\delta_1$ | Age. | (1.)         | $\delta_1$ |
|------|--------------|------------|------|--------------|------------|
| 27   | <b>2.174</b> | — .38928   | 47   | <b>1.810</b> | .14132     |
| 28   | 1.78472      | .31224     | 48   | 1.95132      | .14256     |
| 29   | 1.47248      | .23520     | 49   | 2.09388      | .14380     |
| 30   | 1.23728      | .15816     | 50   | 2.23768      | .14504     |
| 31   | 1.07912      | — .08112   | 51   | 2.38272      | .14628     |
| 32   | <b>.998</b>  | + .22232   | 52   | <b>2.529</b> | .20096     |
| 33   | 1.22032      | .18616     | 53   | 2.72996      | .17548     |
| 34   | 1.40648      | .15000     | 54   | 2.90544      | .15000     |
| 35   | 1.55648      | .11384     | 55   | 3.05544      | .12452     |
| 36   | 1.67032      | + .07768   | 56   | 3.17996      | + .09904   |
| 37   | <b>1.748</b> | — .06040   | 57   | <b>3.279</b> | — .01148   |
| 38   | 1.68760      | .04560     | 58   | 3.26752      | + .00556   |
| 39   | 1.64200      | .03080     | 59   | 3.27308      | .02260     |
| 40   | 1.61120      | .01600     | 60   | 3.29568      | .03964     |
| 41   | 1.59520      | — .00120   | 61   | 3.33532      | + .05668   |
| 42   | <b>1.594</b> | + .00296   | 62   | <b>3.392</b> | — .21124   |
| 43   | 1.59696      | .02308     | 63   | 3.18076      | — .05172   |
| 44   | 1.62004      | .04320     | 64   | 3.12904      | + .10780   |
| 45   | 1.66324      | .06332     | 65   | 3.23684      | .26732     |
| 46   | 1.72656      | .08344     | 66   | 3.50416      | .42684     |
| 47   | <b>1.810</b> |            | 67   | <b>3.931</b> |            |



TABLE V.—(continued.)

| Age. | (1).    | $\delta_1$ | Age. | (1).     | $\delta_1$ |
|------|---------|------------|------|----------|------------|
| 67   | 3.931   | 1.10212    | 77   | 10.526   | 1.90232    |
| 68   | 5.03312 | 1.00376    | 78   | 12.42832 | 2.39856    |
| 69   | 6.03688 | .90540     | 79   | 14.82688 | 2.89480    |
| 70   | 6.94228 | .80704     | 80   | 17.72168 | 3.39104    |
| 71   | 7.74932 | + .70868   | 81   | 21.11272 | + 3.88728  |
| 72   | 8.458   | — .57888   | 82   | 25.000   | ...        |
| 73   | 7.87912 | — .08264   | ...  | ...      | ...        |
| 74   | 7.79648 | + .41360   | ...  | ...      | ...        |
| 75   | 8.21008 | .90984     | ...  | ...      | ...        |
| 76   | 9.11992 | 1.40608    | ...  | ...      | ...        |

From the results obtained in Table V the following Table of Decrements is derived:—

TABLE VI.

*Married Members.*

| Age. | Mortality<br>per Cent.<br>$= d.$<br>$1 - \frac{d}{100}$ | $\lambda l$<br>$\lambda \left(1 - \frac{d}{100}\right) = c$<br>$5 + \Sigma(c) = \lambda l$ | Number<br>Living<br>$= L$ | Number<br>Dying. | Age. | Mortality<br>per Cent.<br>$= d.$<br>$1 - \frac{d}{100}$ | $\lambda l$<br>$\lambda \left(1 - \frac{d}{100}\right) = c$<br>$5 + \Sigma(c) = \lambda l$ | Number<br>Living<br>$= L$ | Number<br>Dying. |
|------|---------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------|------------------|------|---------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------|------------------|
| 25   | 2.174                                                   | 5.00000                                                                                    | 100,000                   | 2,175            | 37   | 1.748                                                   | 4.91702                                                                                    | 82,608                    | 1,445            |
| 26   | .97826                                                  | 9.99045                                                                                    |                           |                  | 38   | .98252                                                  | 9.99234                                                                                    |                           |                  |
| 26   | 2.174                                                   | 4.99045                                                                                    | 97,825                    | 2,128            | 38   | 1.688                                                   | .90936                                                                                     | 81,163                    | 1,369            |
| 27   | .97826                                                  | .99045                                                                                     |                           |                  | 39   | .98312                                                  | .99261                                                                                     |                           |                  |
| 27   | 2.174                                                   | .98090                                                                                     | 95,697                    | 2,081            | 39   | 1.642                                                   | .90197                                                                                     | 79,794                    | 1,310            |
| 28   | .97826                                                  | .99045                                                                                     |                           |                  | 40   | .98358                                                  | .99281                                                                                     |                           |                  |
| 28   | 1.785                                                   | .97135                                                                                     | 93,616                    | 1,671            | 40   | 1.611                                                   | .89478                                                                                     | 78,484                    | 1,264            |
| 29   | .98215                                                  | .99218                                                                                     |                           |                  | 41   | .98389                                                  | .99295                                                                                     |                           |                  |
| 29   | 1.472                                                   | .96353                                                                                     | 91,945                    | 1,353            | 41   | 1.595                                                   | .88773                                                                                     | 77,220                    | 1,231            |
| 30   | .98528                                                  | .99356                                                                                     |                           |                  | 42   | .98405                                                  | .99302                                                                                     |                           |                  |
| 30   | 1.237                                                   | .95709                                                                                     | 90,592                    | 1,121            | 42   | 1.594                                                   | .88075                                                                                     | 75,987                    | 1,212            |
| 31   | .98763                                                  | .99459                                                                                     |                           |                  | 43   | .98406                                                  | .99302                                                                                     |                           |                  |
| 31   | 1.079                                                   | .95168                                                                                     | 89,471                    | 966              | 43   | 1.597                                                   | .87377                                                                                     | 74,777                    | 1,194            |
| 32   | .98921                                                  | .99529                                                                                     |                           |                  | 44   | .98403                                                  | .99301                                                                                     |                           |                  |
| 32   | .998                                                    | .94697                                                                                     | 83,505                    | 882              | 44   | 1.620                                                   | .86678                                                                                     | 73,583                    | 1,191            |
| 33   | .99002                                                  | .99565                                                                                     |                           |                  | 45   | .98380                                                  | .99291                                                                                     |                           |                  |
| 33   | 1.220                                                   | .94262                                                                                     | 87,623                    | 1,168            | 45   | 1.663                                                   | .85969                                                                                     | 72,392                    | 1,203            |
| 34   | .98780                                                  | .99467                                                                                     |                           |                  | 46   | .98337                                                  | .99272                                                                                     |                           |                  |
| 34   | 1.406                                                   | .93729                                                                                     | 86,555                    | 1,217            | 46   | 1.727                                                   | .85241                                                                                     | 71,189                    | 1,229            |
| 35   | .98594                                                  | .99385                                                                                     |                           |                  | 47   | .98273                                                  | .99244                                                                                     |                           |                  |
| 35   | 1.556                                                   | .93114                                                                                     | 85,338                    | 1,328            | 47   | 1.810                                                   | .84485                                                                                     | 69,960                    | 1,266            |
| 36   | .98444                                                  | .99319                                                                                     |                           |                  | 48   | .98190                                                  | .99207                                                                                     |                           |                  |
| 36   | 1.670                                                   | 4.92433                                                                                    | 84,010                    | 1,402            | 48   | 1.951                                                   | 4.83692                                                                                    | 68,694                    | 1,339            |
|      | .98330                                                  | 9.99269                                                                                    |                           |                  |      | .98049                                                  | 9.99145                                                                                    |                           |                  |



TABLE VI.—(continued)

| Age. | Mortality<br>per Cent.<br>= $d$ .<br>$1 - \frac{d}{100}$ | $\lambda l$<br>$\lambda \left(1 - \frac{d}{100}\right) = c$<br>$5 + \Sigma(c) = \lambda l$ | Number<br>Living.<br>= $l$ . | Number<br>Dying. | Age. | Mortality<br>per Cent.<br>= $d$ .<br>$1 - \frac{d}{100}$ | $\lambda l$<br>$\lambda \left(1 - \frac{d}{100}\right) = c$<br>$5 + \Sigma(c) = \lambda l$ | Number<br>Living.<br>= $l$ . | Number<br>Dying. |
|------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------|------------------|------|----------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------|------------------|
| 49   | 2.094                                                    | 4.82837                                                                                    | 67,355                       | 1,410            | 75   | 8.210                                                    | 4.34772                                                                                    | 22,270                       | 1,828            |
|      | .97906                                                   | 9.99081                                                                                    |                              |                  |      | .91790                                                   | 9.96280                                                                                    |                              |                  |
| 50   | 2.238                                                    | .81918                                                                                     | 65,945                       | 1,476            | 76   | 9.120                                                    | .31052                                                                                     | 20,442                       | 1,864            |
|      | .97762                                                   | .99017                                                                                     |                              |                  |      | .90880                                                   | .95847                                                                                     |                              |                  |
| 51   | 2.383                                                    | .80935                                                                                     | 64,469                       | 1,537            | 77   | 10.526                                                   | .26899                                                                                     | 18,578                       | 1,956            |
|      | .97617                                                   | .98952                                                                                     |                              |                  |      | .89474                                                   | .95170                                                                                     |                              |                  |
| 52   | 2.529                                                    | .79887                                                                                     | 62,932                       | 1,593            | 78   | 10.924                                                   | .22069                                                                                     | 16,622                       | 1,816            |
|      | .97471                                                   | .98887                                                                                     |                              |                  |      | .89076                                                   | .94976                                                                                     |                              |                  |
| 53   | 2.730                                                    | .78774                                                                                     | 61,339                       | 1,674            | 79   | 11.896                                                   | .17045                                                                                     | 14,806                       | 1,761            |
|      | .97270                                                   | .98798                                                                                     |                              |                  |      | .88104                                                   | .94500                                                                                     |                              |                  |
| 54   | 2.905                                                    | .77572                                                                                     | 59,665                       | 1,733            | 80   | 12.889                                                   | .11545                                                                                     | 13,045                       | 1,681            |
|      | .97095                                                   | .98720                                                                                     |                              |                  |      | .87111                                                   | .94008                                                                                     |                              |                  |
| 55   | 3.055                                                    | .76292                                                                                     | 57,932                       | 1,770            | 81   | 13.972                                                   | 4.05553                                                                                    | 11,364                       | 1,588            |
|      | .96945                                                   | .98652                                                                                     |                              |                  |      | .86028                                                   | .93464                                                                                     |                              |                  |
| 56   | 3.180                                                    | .74944                                                                                     | 56,162                       | 1,786            | 82   | 15.055                                                   | 3.99017                                                                                    | 9,776                        | 1,472            |
|      | .96820                                                   | .98597                                                                                     |                              |                  |      | .84945                                                   | .92913                                                                                     |                              |                  |
| 57   | 3.279                                                    | .73541                                                                                     | 54,376                       | 1,783            | 83   | 16.206                                                   | .91930                                                                                     | 8,304                        | 1,346            |
|      | .96721                                                   | .98552                                                                                     |                              |                  |      | .83794                                                   | .92321                                                                                     |                              |                  |
| 58   | 3.268                                                    | .72093                                                                                     | 52,593                       | 1,719            | 84   | 17.399                                                   | .84251                                                                                     | 6,958                        | 1,210            |
|      | .96732                                                   | .98557                                                                                     |                              |                  |      | .82601                                                   | .91699                                                                                     |                              |                  |
| 59   | 3.273                                                    | .70650                                                                                     | 50,874                       | 1,664            | 85   | 18.716                                                   | .75950                                                                                     | 5,748                        | 1,076            |
|      | .96727                                                   | .98555                                                                                     |                              |                  |      | .81284                                                   | .91000                                                                                     |                              |                  |
| 60   | 3.296                                                    | .69205                                                                                     | 49,210                       | 1,622            | 86   | 20.098                                                   | .66950                                                                                     | 4,672                        | 939              |
|      | .96700                                                   | .98545                                                                                     |                              |                  |      | .79902                                                   | .90256                                                                                     |                              |                  |
| 61   | 3.335                                                    | .67750                                                                                     | 47,588                       | 1,587            | 87   | 21.777                                                   | .57206                                                                                     | 3,733                        | 813              |
|      | .96665                                                   | .98527                                                                                     |                              |                  |      | .78223                                                   | .89333                                                                                     |                              |                  |
| 62   | 3.392                                                    | .66277                                                                                     | 46,001                       | 1,560            | 88   | 23.095                                                   | .46539                                                                                     | 2,920                        | 674              |
|      | .96608                                                   | .98501                                                                                     |                              |                  |      | .76905                                                   | .88595                                                                                     |                              |                  |
| 63   | 3.181                                                    | .64778                                                                                     | 44,441                       | 1,413            | 89   | 24.687                                                   | .35134                                                                                     | 2,246                        | 555              |
|      | .96819                                                   | .98597                                                                                     |                              |                  |      | .75313                                                   | .87687                                                                                     |                              |                  |
| 64   | 3.129                                                    | .63375                                                                                     | 43,028                       | 1,347            | 90   | 26.277                                                   | .22821                                                                                     | 1,691                        | 444              |
|      | .96871                                                   | .98619                                                                                     |                              |                  |      | .73723                                                   | .86760                                                                                     |                              |                  |
| 65   | 3.237                                                    | .61994                                                                                     | 41,681                       | 1,349            | 91   | 27.877                                                   | 3.09581                                                                                    | 1,247                        | 348              |
|      | .96763                                                   | .98571                                                                                     |                              |                  |      | .72123                                                   | .85808                                                                                     |                              |                  |
| 66   | 3.504                                                    | .60565                                                                                     | 40,332                       | 1,412            | 92   | 29.528                                                   | 2.95389                                                                                    | 899                          | 265              |
|      | .96496                                                   | .98452                                                                                     |                              |                  |      | .70472                                                   | .84801                                                                                     |                              |                  |
| 67   | 3.931                                                    | .59017                                                                                     | 38,920                       | 1,530            | 93   | 31.127                                                   | .80190                                                                                     | 634                          | 198              |
|      | .96069                                                   | .98259                                                                                     |                              |                  |      | .68873                                                   | .83805                                                                                     |                              |                  |
| 68   | 5.033                                                    | .57276                                                                                     | 37,390                       | 1,882            | 94   | 32.817                                                   | .63995                                                                                     | 436                          | 143              |
|      | .94967                                                   | .97757                                                                                     |                              |                  |      | .67183                                                   | .82726                                                                                     |                              |                  |
| 69   | 6.037                                                    | .55033                                                                                     | 35,508                       | 2,144            | 95   | 34.297                                                   | .46721                                                                                     | 293                          | 100              |
|      | .93963                                                   | .97295                                                                                     |                              |                  |      | .65703                                                   | .81759                                                                                     |                              |                  |
| 70   | 6.942                                                    | .52328                                                                                     | 33,364                       | 2,316            | 96   | 35.572                                                   | .28480                                                                                     | 193                          | 69               |
|      | .93058                                                   | .96875                                                                                     |                              |                  |      | .64428                                                   | .80908                                                                                     |                              |                  |
| 71   | 7.749                                                    | .49203                                                                                     | 31,048                       | 2,406            | 97   | 36.644                                                   | 2.09388                                                                                    | 124                          | 45               |
|      | .92251                                                   | .96497                                                                                     |                              |                  |      | .63356                                                   | .80179                                                                                     |                              |                  |
| 72   | 8.458                                                    | .45700                                                                                     | 28,642                       | 2,423            | 98   | 37.482                                                   | 1.89567                                                                                    | 79                           | 30               |
|      | .91542                                                   | .96162                                                                                     |                              |                  |      | .62518                                                   | .79601                                                                                     |                              |                  |
| 73   | 7.879                                                    | .41862                                                                                     | 26,219                       | 2,066            | 99   | 38.066                                                   | .69168                                                                                     | 49                           | 19               |
|      | .92121                                                   | .96435                                                                                     |                              |                  |      | .61934                                                   | .79163                                                                                     |                              |                  |
| 74   | 7.796                                                    | 4.38297                                                                                    | 24,153                       | 1,883            | 100  | 38.650                                                   | .48361                                                                                     | 30                           | 11               |
|      | .92204                                                   | 9.96475                                                                                    |                              |                  |      | .61350                                                   | 9.78781                                                                                    |                              |                  |
|      |                                                          |                                                                                            |                              |                  | 101  |                                                          | 1.27142                                                                                    | 19                           | 7                |



An examination of the results set forth in column 4 of this Table shews that of the number living at age 25, one-half only will be alive in about thirty-four years afterwards, but in the male population of England and Wales one-half would be alive for forty years afterwards. The following shews the equation of life in the above Table, which represents the mortality of the married members of the Society, and also according to the mortality of the male population of England and Wales.

| Ages. | Equation of Life among the                      |                              |
|-------|-------------------------------------------------|------------------------------|
|       | Married Members<br>of the Society.<br>Table VI. | Males.<br>England and Wales. |
| 25    | 34.525                                          | 40.309                       |
| 30    | 32.453                                          | 36.482                       |
| 40    | 26.772                                          | 28.790                       |
| 50    | 20.169                                          | 21.255                       |

The next portion of this paper relates to the rate of mortality among the members of the Royal Medical Chirurgical Society, deduced from a list which was furnished to me of all the resident members elected into the Society since its establishment in the year 1805, specifying the date of election, the causes of withdrawal or removal from the Society, or whether they still continue members. This list has been analysed so as to exhibit, in a clear and simple manner, the rate of mortality among the members.

In the first place attention is directed to Table VII, which furnishes a very interesting and succinct view of the changes of the Society, in respect to the election and withdrawal of its members for each year since the commencement. From the second column of this Table it will be seen that, since the year 1805, 684 resident members have been elected, and, by column 5, 96 of these have died, and, according to column 6, 280 have either resigned or, from some cause or other, have ceased to be resident members, so that out of the whole 684 members elected, 376 have now, from various causes, ceased to belong to the Society, leaving, at the period up to which the abstracts were completed, 308 existing members. The other columns of the Table explain themselves, but the point to which attention is now specially directed is that of the rate of mortality amongst the members. The last column shews the rate of mortality, but Abstract I gives a more condensed and convenient view of the results arrived at:—



TABLE VII.

| Year of Entry. | Number Entered. | Number under Observation from Year preceding. | Total Number under Observation in each Year. | Died. | Resigned, Ceased to Pay, and Ejected. | Total gone off. | Half of  |               |        | Number Exposed to Risk of Mortality. | Mortality per Cent. |
|----------------|-----------------|-----------------------------------------------|----------------------------------------------|-------|---------------------------------------|-----------------|----------|---------------|--------|--------------------------------------|---------------------|
| (1)            | (2)             | (3)                                           | (4)                                          | (5)   | (6)                                   | (7)             | Entered. | Discontinued. | Total. | (11)                                 | (12)                |
| 1805           | 60              | ...                                           | 60                                           | 1     | ...                                   | ...             | 30       | ...           | 30     | 303                                  | 0.330               |
| 1806           | 7               | 60                                            | 67                                           |       | ...                                   | ...             | 3.5      | ...           | 3.5    |                                      |                     |
| 1807           | 2               | 67                                            | 69                                           |       | ...                                   | ...             | 1        | ...           | 1      |                                      |                     |
| 1808           | 3               | 69                                            | 72                                           |       | 1                                     | 1               | 1.5      | .5            | 2      |                                      |                     |
| 1809           | 2               | 71                                            | 73                                           |       | 1                                     | 2               | 1        | .5            | 1.5    |                                      |                     |
| 1810           | 9               | 71                                            | 80                                           | ...   | ...                                   | ...             | 4.5      | ...           | 4.5    | 410.5                                | 0.000               |
| 1811           | 8               | 80                                            | 88                                           | ...   | 19                                    | 19              | 4        | 9.5           | 13.5   |                                      |                     |
| 1812           | 9               | 69                                            | 78                                           | ...   | ...                                   | ...             | 4.5      | ...           | 4.5    |                                      |                     |
| 1813           | 15              | 78                                            | 93                                           | ...   | 1                                     | 1               | 7.5      | .5            | 8      |                                      |                     |
| 1814           | 22              | 92                                            | 114                                          | ...   | 2                                     | 2               | 11       | 1             | 12     |                                      |                     |
| 1815           | 11              | 112                                           | 123                                          | 3     | ...                                   | 7               | 5.5      | 3.5           | 9      | 710                                  | 0.423               |
| 1816           | 23              | 116                                           | 139                                          |       | 1                                     | 2               | 11.5     | 1             | 12.5   |                                      |                     |
| 1817           | 16              | 136                                           | 152                                          |       | ...                                   | 5               | 8        | 2.5           | 10.5   |                                      |                     |
| 1818           | 23              | 147                                           | 170                                          |       | 1                                     | 4               | 11.5     | 2             | 13.5   |                                      |                     |
| 1819           | 18              | 165                                           | 183                                          |       | 1                                     | 5               | 9        | 2.5           | 11.5   |                                      |                     |
| 1820           | 9               | 177                                           | 186                                          | 5     | ...                                   | 6               | 4.5      | 3             | 7.5    | 926                                  | 0.539               |
| 1821           | 13              | 180                                           | 193                                          |       | 2                                     | 9               | 6.5      | 4.5           | 11     |                                      |                     |
| 1822           | 8               | 182                                           | 190                                          |       | ...                                   | 4               | 4        | 2             | 6      |                                      |                     |
| 1823           | 14              | 186                                           | 200                                          |       | ...                                   | 9               | 7        | 4.5           | 11.5   |                                      |                     |
| 1824           | 13              | 191                                           | 204                                          |       | 3                                     | 9               | 6.5      | 4.5           | 11     |                                      |                     |
| 1825           | 6               | 192                                           | 198                                          | 7     | ...                                   | 8               | 3        | 4             | 7      | 950                                  | 1.789               |
| 1826           | 6               | 190                                           | 196                                          |       | 1                                     | 3               | 3        | 1.5           | 4.5    |                                      |                     |
| 1827           | 12              | 192                                           | 204                                          |       | 1                                     | 10              | 6        | 5             | 11     |                                      |                     |
| 1828           | 13              | 183                                           | 196                                          |       | ...                                   | 8               | 6.5      | 4             | 10.5   |                                      |                     |
| 1829           | 8               | 188                                           | 196                                          |       | 5                                     | 6               | 4        | 3             | 7      |                                      |                     |
| 1830           | 6               | 185                                           | 191                                          | 21    | 1                                     | 11              | 3        | 5.5           | 8.5    | 795.5                                | 2.639               |
| 1831           | ...             | 179                                           | 179                                          |       | 7                                     | 19              | ...      | 9.5           | 9.5    |                                      |                     |
| 1832           | 3               | 153                                           | 156                                          |       | 6                                     | 6               | 1.5      | 3             | 4.5    |                                      |                     |
| 1833           | 5               | 144                                           | 149                                          |       | 2                                     | 1               | 2.5      | .5            | 3      |                                      |                     |
| 1834           | 5               | 146                                           | 151                                          |       | 5                                     | 5               | 2.5      | 2.5           | 5      |                                      |                     |
| 1835           | 24              | 141                                           | 165                                          | 9     | 1                                     | 2               | 12       | 1             | 13     | 933                                  | 0.965               |
| 1836           | 26              | 162                                           | 188                                          |       | 2                                     | 3               | 13       | 1.5           | 14.5   |                                      |                     |
| 1837           | 21              | 183                                           | 204                                          |       | ...                                   | 4               | 10.5     | 2             | 12.5   |                                      |                     |
| 1838           | 11              | 200                                           | 211                                          |       | 3                                     | 5               | 5.5      | 2.5           | 8      |                                      |                     |
| 1839           | 24              | 203                                           | 227                                          |       | 3                                     | 4               | 12       | 2             | 14     |                                      |                     |
| 1840           | 21              | 220                                           | 241                                          | 14    | 3                                     | 7               | 10.5     | 3.5           | 14     | 1278.5                               | 1.095               |
| 1841           | 24              | 231                                           | 255                                          |       | 1                                     | 5               | 12       | 2.5           | 14.5   |                                      |                     |
| 1842           | 20              | 249                                           | 269                                          |       | 3                                     | 4               | 10       | 2             | 12     |                                      |                     |
| 1843           | 24              | 262                                           | 286                                          |       | 5                                     | 7               | 12       | 3.5           | 15.5   |                                      |                     |
| 1844           | 30              | 274                                           | 304                                          |       | 2                                     | 11              | 15       | 5.5           | 20.5   |                                      |                     |
| 1845           | 20              | 291                                           | 311                                          | 26    | 7                                     | 11              | 10       | 5.5           | 15.5   | 1527.5                               | 1.702               |
| 1846           | 24              | 293                                           | 317                                          |       | 6                                     | 15              | 12       | 7.5           | 19.5   |                                      |                     |
| 1847           | 29              | 296                                           | 325                                          |       | 3                                     | 13              | 14.5     | 6.5           | 21     |                                      |                     |
| 1848           | 22              | 309                                           | 331                                          |       | 2                                     | 12              | 11       | 6             | 17     |                                      |                     |
| 1849           | 15              | 327                                           | 332                                          |       | 8                                     | 16              | 7.5      | 8             | 15.5   |                                      |                     |
| 1850           | ...             | 308                                           | ...                                          | ...   | ...                                   | ...             | ...      | ...           | ...    | ...                                  | ...                 |
|                | 684             | ...                                           | 8,316                                        | 96    | 280                                   | 376             | 342.0    | 140.0         | 482.0  | 7834.0                               | 1.225               |



## ABSTRACT I.

| Years.        | Number Exposed to Risk. | Died. | Mortality per Cent. |
|---------------|-------------------------|-------|---------------------|
| 1805 to 1809  | 303.0                   | 1     | 0.330               |
| 1810 ... 1814 | 410.5                   | ...   | 0.000               |
| 1815 ... 1819 | 710.0                   | 3     | 0.423               |
| 1820 ... 1824 | 926.6                   | 5     | 0.539               |
| 1825 ... 1829 | 950.0                   | 17    | 1.789               |
| 1830 ... 1834 | 795.5                   | 21    | 2.639               |
| 1835 ... 1839 | 933.0                   | 9     | 0.965               |
| 1840 ... 1844 | 1278.5                  | 14    | 1.095               |
| 1845 ... 1849 | 1527.5                  | 26    | 1.702               |
| Total.....    | 7834.0                  | 96    | 1.225               |

So far as these results extend, and considering the limits within which the ages of the members, on admission, must range, it is evident that the mortality of the members is under that of the population of the country generally.

Attention is next requested to Table VIII, which very much resembles Table VII, only that the final column exhibits the ratio of withdrawals from all causes, inclusive of deaths, for each year of the Society's existence. From the following condensed Abstract of this Table, it will be seen that, with the exception of the first quinquennial period of years, there is no very extraordinary fluctuation in the ratio of withdrawals from the general average.

## ABSTRACT J.

| Year of Entry. | Number Exposed to Risk of Withdrawal. | Total gone off. | Per Centage of Total Withdrawals. |
|----------------|---------------------------------------|-----------------|-----------------------------------|
| 1805 to 1809   | 304.0                                 | 3               | 0.987                             |
| 1810 ... 1814  | 421.5                                 | 22              | 5.219                             |
| 1815 ... 1819  | 721.5                                 | 26              | 3.604                             |
| 1820 ... 1824  | 944.5                                 | 42              | 4.447                             |
| 1825 ... 1829  | 967.5                                 | 52              | 5.375                             |
| 1830 ... 1834  | 816.5                                 | 63              | 7.716                             |
| 1835 ... 1839  | 942.0                                 | 27              | 2.866                             |
| 1840 ... 1844  | 1295.5                                | 48              | 3.705                             |
| 1845 ... 1849  | 1561.0                                | 93              | 5.951                             |
| Total.....     | 7974.0                                | 376             | 4.715                             |

It is obvious, however, that Tables VII and VIII give, simply, a chronological view of the Society since its commencement, exhibiting the changes which have taken place in its members during each particular year. It is, however, evident that the more important aspect in which to look at the question is the ratio of withdrawals from the Society, from various causes, during the first, second, and each succeeding year of membership, without regard to the chronological dates of these events. Table IX has, therefore, been constructed [on this



TABLE VIII.

| Year of Entry. | Number Entered | Number under Observation from Year preceding. | Total Number under Observation in each Year. | Died. | Resigned, Ceased to Pay, and Ejected. | Total gone off. | Half of Entered. | Number Exposed to Risk of Withdrawal from the Society from all causes, including Death. | Per Centage of Total Withdrawals. |
|----------------|----------------|-----------------------------------------------|----------------------------------------------|-------|---------------------------------------|-----------------|------------------|-----------------------------------------------------------------------------------------|-----------------------------------|
| (1)            | (2)            | (3)                                           | (4)                                          | (5)   | (6)                                   | (7)             | (8)              | (9)                                                                                     | (10)                              |
| 1805           | 60             | ...                                           | 60                                           | ...   | ...                                   | ...             | 30               | 30                                                                                      | 0.987                             |
| 1806           | 7              | 60                                            | 67                                           | ...   | ...                                   | ...             | 3.5              | 63.5                                                                                    |                                   |
| 1807           | 2              | 67                                            | 69                                           | ...   | ...                                   | 3               | 1                | 68                                                                                      |                                   |
| 1808           | 3              | 69                                            | 72                                           | ...   | 1                                     | 1               | 1.5              | 70.5                                                                                    |                                   |
| 1809           | 2              | 71                                            | 73                                           | 1     | 1                                     | 2               | 1                | 72                                                                                      |                                   |
| 1810           | 9              | 71                                            | 80                                           | ...   | ...                                   | ...             | 4.5              | 75.5                                                                                    | 5.219                             |
| 1811           | 8              | 80                                            | 88                                           | ...   | 19                                    | 19              | 4                | 84                                                                                      |                                   |
| 1812           | 9              | 69                                            | 78                                           | ...   | ...                                   | 22              | 4.5              | 73.5                                                                                    |                                   |
| 1813           | 15             | 78                                            | 93                                           | ...   | 1                                     | 1               | 7.5              | 85.5                                                                                    |                                   |
| 1814           | 22             | 92                                            | 114                                          | ...   | 2                                     | 2               | 11               | 103                                                                                     |                                   |
| 1815           | 11             | 112                                           | 123                                          | ...   | 7                                     | 7               | 5.5              | 117.5                                                                                   | 3.604                             |
| 1816           | 23             | 116                                           | 139                                          | 1     | 2                                     | 3               | 11.5             | 127.5                                                                                   |                                   |
| 1817           | 16             | 136                                           | 152                                          | ...   | 5                                     | 26              | 8                | 144                                                                                     |                                   |
| 1818           | 23             | 147                                           | 170                                          | 1     | 4                                     | 5               | 11.5             | 158.5                                                                                   |                                   |
| 1819           | 18             | 165                                           | 183                                          | 1     | 5                                     | 6               | 9                | 174                                                                                     |                                   |
| 1820           | 9              | 177                                           | 186                                          | ...   | 6                                     | 6               | 4.5              | 181.5                                                                                   | 4.447                             |
| 1821           | 13             | 180                                           | 193                                          | 2     | 9                                     | 11              | 6.5              | 186.5                                                                                   |                                   |
| 1822           | 8              | 182                                           | 190                                          | ...   | 4                                     | 42              | 4                | 186                                                                                     |                                   |
| 1823           | 14             | 186                                           | 200                                          | ...   | 9                                     | 9               | 7                | 193                                                                                     |                                   |
| 1824           | 13             | 191                                           | 204                                          | 3     | 9                                     | 12              | 6.5              | 197.5                                                                                   |                                   |
| 1825           | 6              | 192                                           | 198                                          | ...   | 8                                     | 8               | 3                | 195                                                                                     | 5.375                             |
| 1826           | 6              | 190                                           | 196                                          | 1     | 3                                     | 4               | 3                | 193                                                                                     |                                   |
| 1827           | 12             | 192                                           | 204                                          | 11    | 10                                    | 52              | 6                | 198                                                                                     |                                   |
| 1828           | 13             | 183                                           | 196                                          | ...   | 8                                     | 8               | 6.5              | 189.5                                                                                   |                                   |
| 1829           | 8              | 188                                           | 196                                          | 5     | 6                                     | 11              | 4                | 192                                                                                     |                                   |
| 1830           | 6              | 185                                           | 191                                          | 1     | 11                                    | 12              | 3                | 188                                                                                     | 7.716                             |
| 1831           | ...            | 179                                           | 179                                          | 7     | 19                                    | 26              | ...              | 179                                                                                     |                                   |
| 1832           | 3              | 153                                           | 156                                          | 6     | 6                                     | 63              | 1.5              | 154.5                                                                                   |                                   |
| 1833           | 5              | 144                                           | 149                                          | 2     | 1                                     | 3               | 2.5              | 146.5                                                                                   |                                   |
| 1834           | 5              | 146                                           | 151                                          | 5     | 5                                     | 10              | 2.5              | 148.5                                                                                   |                                   |
| 1835           | 24             | 141                                           | 165                                          | 1     | 2                                     | 3               | 12               | 153                                                                                     | 2.866                             |
| 1836           | 26             | 162                                           | 188                                          | 2     | 3                                     | 5               | 13               | 175                                                                                     |                                   |
| 1837           | 21             | 183                                           | 204                                          | ...   | 4                                     | 27              | 10.5             | 193.5                                                                                   |                                   |
| 1838           | 11             | 200                                           | 211                                          | 3     | 5                                     | 8               | 5.5              | 205.5                                                                                   |                                   |
| 1839           | 24             | 203                                           | 227                                          | 3     | 4                                     | 7               | 12               | 215                                                                                     |                                   |
| 1840           | 21             | 220                                           | 241                                          | 3     | 7                                     | 10              | 10.5             | 230.5                                                                                   | 3.705                             |
| 1841           | 24             | 231                                           | 255                                          | 1     | 5                                     | 6               | 12               | 243                                                                                     |                                   |
| 1842           | 20             | 249                                           | 269                                          | 3     | 4                                     | 48              | 10               | 259                                                                                     |                                   |
| 1843           | 24             | 262                                           | 286                                          | 5     | 7                                     | 12              | 12               | 274                                                                                     |                                   |
| 1844           | 30             | 274                                           | 304                                          | 2     | 11                                    | 13              | 15               | 289                                                                                     |                                   |
| 1845           | 20             | 291                                           | 311                                          | 7     | 11                                    | 18              | 10               | 301                                                                                     | 5.951                             |
| 1846           | 24             | 293                                           | 317                                          | 6     | 15                                    | 21              | 12               | 305                                                                                     |                                   |
| 1847           | 29             | 296                                           | 325                                          | 3     | 13                                    | 93              | 14.5             | 310.5                                                                                   |                                   |
| 1848           | 22             | 309                                           | 331                                          | 2     | 12                                    | 14              | 11               | 320                                                                                     |                                   |
| 1849           | 15             | 327                                           | 332                                          | 8     | 16                                    | 24              | 7.5              | 324.5                                                                                   |                                   |
| 1850           | ...            | 308                                           | ...                                          | ...   | ...                                   | ...             | ...              | ...                                                                                     | ...                               |
|                | 684            | ...                                           | 8,316                                        | 96    | 280                                   | 376             | 342.0            | 7974.0                                                                                  | 4.715                             |



TABLE IX.

*Rate of Mortality among the Members of the Royal Medical and Chirurgical Society.*

| Years<br>in the<br>Society. | Number<br>under<br>Observation<br>in each<br>Year. | Died. | Discontinued.<br>Resigned,<br>Ceased to Pay,<br>and<br>Ejected. | Alive. | Total<br>gone off. | Half<br>of<br>Discon-<br>tinued. | Number<br>Exposed to Risk<br>of<br>Mortality. | Mortality<br>per Cent. |
|-----------------------------|----------------------------------------------------|-------|-----------------------------------------------------------------|--------|--------------------|----------------------------------|-----------------------------------------------|------------------------|
| (1)                         | (2)                                                | (3)   | (4)                                                             | (5)    | (6)                | (7)                              | (8)                                           | (9)                    |
| 1                           | 684                                                | 1     | ...                                                             | 15     | 16                 | ...                              | 342                                           | 0.409                  |
| 2                           | 668                                                | 2     | 10                                                              | 22     | 34                 | 5                                | 663                                           |                        |
| 3                           | 634                                                | 2     | 25                                                              | 25     | 52                 | 12.5                             | 621.5                                         |                        |
| 4                           | 582                                                | 4     | 21                                                              | 19     | 44                 | 10.5                             | 571.5                                         |                        |
| 5                           | 538                                                | 7     | 20                                                              | 12     | 39                 | 10                               | 528                                           | 0.639                  |
| 6                           | 499                                                | 3     | 25                                                              | 24     | 52                 | 12.5                             | 486.5                                         |                        |
| 7                           | 447                                                | 1     | 36                                                              | 14     | 51                 | 18                               | 429                                           |                        |
| 8                           | 396                                                | 3     | 15                                                              | 15     | 33                 | 7.5                              | 388.5                                         |                        |
| 9                           | 363                                                | ...   | 9                                                               | 22     | 31                 | 4.5                              | 358.5                                         | 1.477                  |
| 10                          | 332                                                | 2     | 13                                                              | 15     | 30                 | 6.5                              | 325.5                                         |                        |
| 11                          | 302                                                | 5     | 6                                                               | 19     | 30                 | 3                                | 299                                           |                        |
| 12                          | 272                                                | 6     | 12                                                              | 6      | 24                 | 6                                | 266                                           |                        |
| 13                          | 248                                                | 2     | 10                                                              | 14     | 26                 | 5                                | 243                                           | 1.355                  |
| 14                          | 222                                                | 5     | 4                                                               | 11     | 20                 | 2                                | 220                                           |                        |
| 15                          | 202                                                | 5     | 11                                                              | 13     | 29                 | 5.5                              | 196.5                                         |                        |
| 16                          | 173                                                | 1     | 8                                                               | 2      | 11                 | 4                                | 169                                           |                        |
| 17                          | 162                                                | 3     | 7                                                               | 3      | 13                 | 3.5                              | 158.5                                         | 1.383                  |
| 18                          | 149                                                | ...   | 4                                                               | 3      | 7                  | 2                                | 147                                           |                        |
| 19                          | 142                                                | 2     | 3                                                               | ...    | 5                  | 1.5                              | 140.5                                         |                        |
| 20                          | 137                                                | 4     | 8                                                               | 2      | 14                 | 4                                | 133                                           |                        |
| 21                          | 123                                                | 1     | 4                                                               | 4      | 9                  | 2                                | 121                                           | 4.146                  |
| 22                          | 114                                                | ...   | 1                                                               | 3      | 4                  | .5                               | 113.5                                         |                        |
| 23                          | 110                                                | 3     | 2                                                               | 3      | 8                  | 1                                | 109                                           |                        |
| 24                          | 102                                                | ...   | ...                                                             | 1      | 1                  | ...                              | 102                                           |                        |
| 25                          | 101                                                | 2     | 2                                                               | 1      | 5                  | 1                                | 100                                           | 3.500                  |
| 26                          | 96                                                 | 6     | 2                                                               | 6      | 14                 | 1                                | 95                                            |                        |
| 27                          | 82                                                 | 6     | 1                                                               | 2      | 9                  | .5                               | 81.5                                          |                        |
| 28                          | 73                                                 | 1     | 5                                                               | 2      | 8                  | 2.5                              | 70.5                                          |                        |
| 29                          | 65                                                 | 2     | 4                                                               | 2      | 8                  | 2                                | 63                                            | 8.108                  |
| 30                          | 57                                                 | 5     | 2                                                               | 2      | 9                  | 1                                | 56                                            |                        |
| 31                          | 48                                                 | ...   | 4                                                               | 7      | 11                 | 2                                | 46                                            |                        |
| 32                          | 37                                                 | ...   | 1                                                               | 4      | 5                  | .5                               | 36.5                                          |                        |
| 33                          | 32                                                 | 1     | ...                                                             | 1      | 2                  | ...                              | 32                                            | 22.222                 |
| 34                          | 30                                                 | 1     | 1                                                               | 1      | 3                  | .5                               | 29.5                                          |                        |
| 35                          | 27                                                 | 2     | ...                                                             | 1      | 3                  | ...                              | 27                                            |                        |
| 36                          | 24                                                 | 4     | 3                                                               | 7      | 14                 | 1.5                              | 22.5                                          |                        |
| 37                          | 10                                                 | ...   | ...                                                             | 2      | 2                  | ...                              | 10                                            | 22.222                 |
| 38                          | 8                                                  | ...   | 1                                                               | ...    | 1                  | .5                               | 7.5                                           |                        |
| 39                          | 7                                                  | ...   | ...                                                             | 1      | 1                  | ...                              | 7                                             |                        |
| 40                          | 6                                                  | ...   | ...                                                             | 1      | 1                  | ...                              | 6                                             |                        |
| 41                          | 5                                                  | 1     | ...                                                             | ...    | 1                  | ...                              | 5                                             | 22.222                 |
| 42                          | 4                                                  | 1     | ...                                                             | 1      | 2                  | ...                              | 4                                             |                        |
| 43                          | 2                                                  | 1     | ...                                                             | ...    | 1                  | ...                              | 2                                             |                        |
| 44                          | 1                                                  | 1     | ...                                                             | ...    | 1                  | ...                              | 1                                             |                        |
|                             | 8,316                                              | 96    | 280                                                             | 308    | 684                | 140.0                            | 7834.0                                        | 1.225                  |



on this hypothesis; the first column shews the years of membership, the second column shews the number of members who have been one, two, three, four, &c., years connected with the Society, and the other columns sufficiently explain themselves. It thus appears that of the 684 members elected, *one* died in the first year of membership, and 15 still remain alive, being in the first year of membership. Again, 668 entered on the second year of membership, two died in that year, 10 withdrew from other causes, and 22 are alive who are members of not more than two years' standing. Also four entered on the forty-second year of their membership, one died in that year, and one of them remains alive, being a member of forty-two years' standing. Likewise of the two members who entered on the forty-third year of membership, one died in that year, and the other passed on to the forty-fourth year of membership, and died. It hence appears that the whole 684 members elected have, up to the present time, passed through 8,316 years of observation, or about 12 years to each member; but this must not be confounded with the average period of membership, for the above result is derived from observations on a large number but recently elected; the correct average duration of membership will hereafter appear. The average rate of mortality in this Table will be found to coincide with that of Table VII being 1.225 per cent., but an inspection of the last column shews that as the period of membership increases, or, in other words, as age advances, there is a marked increase in the rate of mortality. The following is a brief Abstract of the results in Table IX.

ABSTRACT K.

| Years in the Society. | Number Exposed to Risk of Mortality. | Died. | Mortality per Cent. |
|-----------------------|--------------------------------------|-------|---------------------|
| 1 to 4                | 2198                                 | 9     | 0.409               |
| 5 ... 9               | 2190.5                               | 14    | 0.639               |
| 10 ... 14             | 1353.5                               | 20    | 1.477               |
| 15 ... 19             | 811.5                                | 11    | 1.355               |
| 20 ... 24             | 578.5                                | 8     | 1.383               |
| 25 ... 29             | 410                                  | 17    | 4.146               |
| 30 ... 34             | 200                                  | 7     | 3.500               |
| 35 ... 39             | 74                                   | 6     | 8.108               |
| 40 ... 44             | 18                                   | 4     | 22.222              |
| Total,.....           | 7834                                 | 96    | 1.225               |

Assuming that the average age of admission of members will range from 25 to 35 years of age, although, perhaps, it may be more strictly stated to range between 25 and 30, an inspection of the above figures will shew that at the younger ages the mortality is much less than the average of the population generally, but at the older and more advanced ages greater.

The next Table, X, is similar in arrangement to Table IX, only shewing in the final column, instead of the rate of mortality, the ratio per cent., as in Table VIII, of withdrawals from the Society from all causes, including death, and here, as in the preceding Table, the causes of withdrawal will be found to increase with the period of membership.

[The following



TABLE X.

*Duration of Membership in the Royal Medical and Chirurgical Society.*

| Years<br>in the<br>Society. | Number<br>under<br>Observation<br>in each<br>Year. | Died. | Resigned<br>Ceased<br>to Pay,<br>and<br>Ejected. | Total. | Alive. | Total<br>gone off. | Number Exposed<br>to Risk of<br>Withdrawal from<br>the Society<br>from all causes,<br>including Death. | Per Centage<br>of Total<br>With-<br>drawals. |
|-----------------------------|----------------------------------------------------|-------|--------------------------------------------------|--------|--------|--------------------|--------------------------------------------------------------------------------------------------------|----------------------------------------------|
| (1)                         | (2)                                                | (3)   | (4)                                              | (5)    | (6)    | (7)                | (8)                                                                                                    | (9)                                          |
| 1                           | 684                                                | 1     | ...                                              | 1      | 15     | 16                 | 342                                                                                                    | 2.920                                        |
| 2                           | 668                                                | 2     | 10                                               | 12     | 22     | 34                 | 668                                                                                                    |                                              |
| 3                           | 634                                                | 2     | 25                                               | 27     | 25     | 52                 | 634                                                                                                    |                                              |
| 4                           | 582                                                | 4     | 21                                               | 25     | 19     | 44                 | 582                                                                                                    |                                              |
| 5                           | 538                                                | 7     | 20                                               | 27     | 12     | 39                 | 538                                                                                                    |                                              |
| 6                           | 499                                                | 3     | 25                                               | 28     | 24     | 52                 | 499                                                                                                    | 5.305                                        |
| 7                           | 447                                                | 1     | 36                                               | 37     | 14     | 51                 | 447                                                                                                    |                                              |
| 8                           | 396                                                | 3     | 15                                               | 18     | 15     | 33                 | 396                                                                                                    |                                              |
| 9                           | 363                                                | ...   | 9                                                | 9      | 22     | 31                 | 363                                                                                                    |                                              |
| 10                          | 332                                                | 2     | 13                                               | 15     | 15     | 30                 | 332                                                                                                    |                                              |
| 11                          | 302                                                | 5     | 6                                                | 11     | 19     | 30                 | 302                                                                                                    | 4.724                                        |
| 12                          | 272                                                | 6     | 12                                               | 18     | 6      | 24                 | 272                                                                                                    |                                              |
| 13                          | 248                                                | 2     | 10                                               | 12     | 14     | 26                 | 248                                                                                                    |                                              |
| 14                          | 222                                                | 5     | 4                                                | 9      | 11     | 20                 | 222                                                                                                    |                                              |
| 15                          | 202                                                | 5     | 11                                               | 16     | 13     | 29                 | 202                                                                                                    |                                              |
| 16                          | 173                                                | 1     | 8                                                | 9      | 2      | 11                 | 173                                                                                                    | 5.314                                        |
| 17                          | 162                                                | 3     | 7                                                | 10     | 3      | 13                 | 162                                                                                                    |                                              |
| 18                          | 149                                                | ...   | 4                                                | 4      | 3      | 7                  | 149                                                                                                    |                                              |
| 19                          | 142                                                | 2     | 3                                                | 5      | ...    | 5                  | 142                                                                                                    |                                              |
| 20                          | 137                                                | 4     | 8                                                | 12     | 2      | 14                 | 137                                                                                                    |                                              |
| 21                          | 123                                                | 1     | 4                                                | 5      | 4      | 9                  | 123                                                                                                    | 3.925                                        |
| 22                          | 114                                                | ...   | 1                                                | 1      | 3      | 4                  | 114                                                                                                    |                                              |
| 23                          | 110                                                | 3     | 2                                                | 5      | 3      | 8                  | 110                                                                                                    |                                              |
| 24                          | 102                                                | ...   | ...                                              | ...    | 1      | 1                  | 102                                                                                                    |                                              |
| 25                          | 101                                                | 2     | 2                                                | 4      | 1      | 5                  | 101                                                                                                    |                                              |
| 26                          | 96                                                 | 6     | 2                                                | 8      | 6      | 14                 | 96                                                                                                     | 7.434                                        |
| 27                          | 82                                                 | 6     | 1                                                | 7      | 2      | 9                  | 82                                                                                                     |                                              |
| 28                          | 73                                                 | 1     | 5                                                | 6      | 2      | 8                  | 73                                                                                                     |                                              |
| 29                          | 65                                                 | 2     | 4                                                | 6      | 2      | 8                  | 65                                                                                                     |                                              |
| 30                          | 57                                                 | 5     | 2                                                | 7      | 2      | 9                  | 57                                                                                                     |                                              |
| 31                          | 48                                                 | ...   | 4                                                | 4      | 7      | 11                 | 48                                                                                                     | 7.353                                        |
| 32                          | 37                                                 | ...   | 1                                                | 1      | 4      | 5                  | 37                                                                                                     |                                              |
| 33                          | 32                                                 | 1     | ...                                              | 1      | 1      | 2                  | 32                                                                                                     |                                              |
| 34                          | 30                                                 | 1     | 1                                                | 2      | 1      | 3                  | 30                                                                                                     |                                              |
| 35                          | 27                                                 | 2     | ...                                              | 2      | 1      | 3                  | 27                                                                                                     |                                              |
| 36                          | 24                                                 | 4     | 3                                                | 7      | 7      | 14                 | 24                                                                                                     | 13.158                                       |
| 37                          | 10                                                 | ...   | ...                                              | ...    | 2      | 2                  | 10                                                                                                     |                                              |
| 38                          | 8                                                  | ...   | 1                                                | 1      | ...    | 1                  | 8                                                                                                      |                                              |
| 39                          | 7                                                  | ...   | ...                                              | ...    | 1      | 1                  | 7                                                                                                      |                                              |
| 40                          | 6                                                  | ...   | ...                                              | ...    | 1      | 1                  | 6                                                                                                      |                                              |
| 41                          | 5                                                  | 1     | ...                                              | 1      | ...    | 1                  | 5                                                                                                      | 22.222                                       |
| 42                          | 4                                                  | 1     | ...                                              | 1      | 1      | 2                  | 4                                                                                                      |                                              |
| 43                          | 2                                                  | 1     | ...                                              | 1      | ...    | 1                  | 2                                                                                                      |                                              |
| 44                          | 1                                                  | 1     | ...                                              | 1      | ...    | 1                  | 1                                                                                                      |                                              |
|                             | 8,316                                              | 96    | 280                                              | 376    | 308    | 684                | 7,974                                                                                                  | 4.715                                        |



The following is a condensed abstract of Table X:—

ABSTRACT L.

| Years in the Society. | Number Exposed<br>to Risk<br>of Withdrawal. | Died, Resigned,<br>Ceased to Pay,<br>and Ejected. | Per Centage<br>of<br>Total Withdrawals. |
|-----------------------|---------------------------------------------|---------------------------------------------------|-----------------------------------------|
| 1 to 4                | 2,226                                       | 65                                                | 2.920                                   |
| 5 ... 9               | 2,243                                       | 119                                               | 5.305                                   |
| 10 ... 14             | 1,376                                       | 65                                                | 4.724                                   |
| 15 ... 19             | 828                                         | 44                                                | 5.314                                   |
| 20 ... 24             | 586                                         | 23                                                | 3.925                                   |
| 25 ... 29             | 417                                         | 31                                                | 7.434                                   |
| 30 ... 34             | 204                                         | 15                                                | 7.353                                   |
| 35 ... 39             | 76                                          | 10                                                | 13.158                                  |
| 40 ... 44             | 18                                          | 4                                                 | 22.222                                  |
| Total.....            | 7,974                                       | 376                                               | 4.715                                   |

From the results of this Abstract, Table XI has been constructed so as to exhibit in an interesting manner the average duration of membership as deduced from the experience of the Royal Medical Chirurgical Society, from its establishment, in the year 1805, up to the present time.

This Table has been constructed from the results set forth in the last column of Abstract L, in the same manner in which Table VI, preceding, was constructed from the figures given in Abstract E, only that, in the former case, third differences were used in the interpolations, but in the later instances, second differences only, see the subsequent portion of these contributions on the Mortality of Master Mariners.

Assuming that 100,000 members, or any submultiple by ten of that number, entered the Society, column 4 will shew the numbers remaining in the Society in each succeeding year, and column 5 will shew the number of members withdrawing from all causes. Hence, of 100,000 members, 1920 would withdraw in the first year of membership, or of 1000 entering, 19 would withdraw. Again, of 1000 members elected into the Society, 516 would enter on the fifteenth year of membership, and 486 on their sixteenth year, or, in other words, the equation of membership, or what is technically of almost the same value for the present purpose, the expectation of membership when just elected is about fifteen and a half years. If the experience of this Society can be taken as any criterion of that of other learned societies, this result deduced from the preceding Table would be of some practical importance in the regulation of the composition-money required in lieu of the annual subscriptions paid by members. Keeping in view the fact that the expectation of membership is about fifteen years, it is easy to determine the present value of a corresponding annuity. By the term "present value," is meant the single sum of money [which paid



TABLE XI.

*Decrements of Membership in the Royal Medical and Chirurgical Society of London.*

| Years. | Per<br>Centage<br>= $d$ . | $\lambda l$<br>$d + \Sigma(c) = \lambda l$ .<br>$\lambda(1 - \frac{d}{100}) = c$ | Number of Members<br>in the Society<br>at the beginning of<br>each Year from<br>the Date of<br>Admission<br>= $l$ . | Decrements<br>= $\delta$ . | Years. | Per<br>Centage<br>= $d$ . | $\lambda l$<br>$d + \Sigma(c) = \lambda l$ .<br>$\lambda(1 - \frac{d}{100}) = c$ | Number of Members<br>in the Society<br>at the beginning of<br>each Year from<br>the Date of<br>Admission<br>= $l$ . | Decrements<br>= $\delta$ . |
|--------|---------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------|--------|---------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|----------------------------|
| 1      | 1.920                     | 5.0000000<br>9.9915835<br>4.9915805                                              | 100,000                                                                                                             | 1,920                      | 22     | 3.925                     | 4.5575004<br>9.9826104<br>.5401108                                               | 36,099                                                                                                              | 1,416                      |
| 2      | 2.920                     | .9871298<br>.9787103                                                             | 98,080                                                                                                              | 2,864                      | 23     | 5.369                     | .9760334<br>.5161442                                                             | 34,683                                                                                                              | 1,863                      |
| 3      | 3.833                     | .9830261<br>.9617364                                                             | 95,216                                                                                                              | 3,650                      | 24     | 6.366                     | .9714336<br>.4875778                                                             | 32,820                                                                                                              | 2,089                      |
| 4      | 4.495                     | .9800261<br>.9417625                                                             | 91,566                                                                                                              | 4,115                      | 25     | 6.992                     | .9685203<br>.4560981                                                             | 30,731                                                                                                              | 2,149                      |
| 5      | 4.939                     | .9780024<br>.9197649                                                             | 87,451                                                                                                              | 4,320                      | 26     | 7.323                     | .9669720<br>.4230701                                                             | 28,582                                                                                                              | 2,093                      |
| 6      | 5.198                     | .9768175<br>.8965824                                                             | 83,131                                                                                                              | 4,321                      | 27     | 7.434                     | .9664515<br>.3895216                                                             | 26,489                                                                                                              | 1,969                      |
| 7      | 5.305                     | .9763270<br>.8729094                                                             | 78,810                                                                                                              | 4,181                      | 28     | 7.073                     | .9681419<br>.3576635                                                             | 24,520                                                                                                              | 1,734                      |
| 8      | 5.246                     | .9765976<br>.8495070                                                             | 74,629                                                                                                              | 3,915                      | 29     | 6.863                     | .9691222<br>.3267857                                                             | 22,786                                                                                                              | 1,564                      |
| 9      | 5.134                     | .9771106<br>.8266176                                                             | 70,714                                                                                                              | 3,630                      | 30     | 6.826                     | .9692947<br>.2960804                                                             | 21,222                                                                                                              | 1,449                      |
| 10     | 4.992                     | .9777602<br>.8043778                                                             | 67,084                                                                                                              | 3,349                      | 31     | 6.982                     | .9685670<br>.2646474                                                             | 19,773                                                                                                              | 1,380                      |
| 11     | 4.847                     | .9784225<br>.7828003                                                             | 63,735                                                                                                              | 3,089                      | 32     | 7.353                     | .9668314<br>.2314788                                                             | 18,393                                                                                                              | 1,353                      |
| 12     | 4.724                     | .9789835<br>.7617838                                                             | 60,646                                                                                                              | 2,865                      | 33     | 7.740                     | .9650135<br>.1964923                                                             | 17,040                                                                                                              | 1,319                      |
| 13     | 5.330                     | .9762124<br>.7379962                                                             | 57,781                                                                                                              | 3,080                      | 34     | 8.438                     | .9617153<br>.1582076                                                             | 15,721                                                                                                              | 1,326                      |
| 14     | 5.638                     | .9747971<br>.7127933                                                             | 54,701                                                                                                              | 3,084                      | 35     | 9.523                     | .9575382<br>.1157458                                                             | 14,395                                                                                                              | 1,341                      |
| 15     | 5.701                     | .9745071<br>.6873004                                                             | 51,617                                                                                                              | 2,943                      | 36     | 11.071                    | .9490434<br>.0647892                                                             | 13,054                                                                                                              | 1,445                      |
| 16     | 5.574                     | .9750916<br>.6623920                                                             | 48,674                                                                                                              | 2,713                      | 37     | 13.158                    | .9387298<br>.0035190                                                             | 11,609                                                                                                              | 1,528                      |
| 17     | 5.314                     | .9762858<br>.6386778                                                             | 45,961                                                                                                              | 2,442                      | 38     | 14.626                    | .9313256<br>3.9348446                                                            | 10,081                                                                                                              | 1,474                      |
| 18     | 5.060                     | .9774492<br>.6161270                                                             | 43,519                                                                                                              | 2,202                      | 39     | 16.244                    | .9230159<br>.8578605                                                             | 8,607                                                                                                               | 1,398                      |
| 19     | 4.727                     | .9789698<br>.5950968                                                             | 41,317                                                                                                              | 1,953                      | 40     | 18.036                    | .9136231<br>.7714836                                                             | 7,209                                                                                                               | 1,300                      |
| 20     | 4.381                     | .9805442<br>4.5756410                                                            | 39,364                                                                                                              | 1,725                      | 41     | 20.020                    | .9029814<br>.6744650                                                             | 5,909                                                                                                               | 1,183                      |
| 21     | 4.091                     | 9.9818594                                                                        | 37,639                                                                                                              | 1,540                      | 42     | 22.222                    | 9.8908568<br>3.5653218                                                           | 4,726                                                                                                               | 1,050                      |
|        |                           |                                                                                  |                                                                                                                     |                            |        |                           |                                                                                  | 3,676                                                                                                               | 908                        |



which paid down, would, if invested at the same rate of interest as the annual subscriptions, meet precisely the same liabilities as they fall due. Assuming that the funds or composition paid in commutation of yearly subscriptions could be invested to yield 3 per cent. compound interest, the present value of the annuity equivalent to that dependent on the expectation of membership is about eleven years' purchase. But there is another view to be taken of this question. If the practice of receiving composition payments were permitted and generally adopted by the members, there can be no doubt that the withdrawals from the Society from other causes than death, or those specified in column 4 of Table D, would be very much reduced. Different societies will, no doubt, be variously affected by these causes, and this feature of Tables VII, VIII, IX, and X, has been introduced here principally in order to direct more general attention to the question.

It is, however, very curious and instructive to observe the rate of mortality developed in some of these latter Tables, and particularly in Table IX and Abstract K, as compared with the rate of mortality found to prevail among the medical officers of the Royal Army. The difference is certainly one of the most remarkable results yet deduced by any inquiry into Vital Statistics.

The following Abstract M shews that throughout the period of life 26-70, the mortality among the members of the Royal Medical and Chirurgical Society approximates very closely to that of the male population of England and Wales, being considerably less between ages 26-35, somewhat higher above 35 years of age, but in the whole term of life, varying from 26 to 70 years of age, the mortality differs but little: the actual number of deaths in the Society being 96, while that which would have taken place according to the mortality of England and Wales is 97·1.

#### ABSTRACT M.

##### *Mortality among the Members of the Royal Medical and Chirurgical Society.*

| Age.      | Number Exposed to Risk. | Mortality per Cent. | Deaths.               |        | England and Wales.  |                                                       |        |
|-----------|-------------------------|---------------------|-----------------------|--------|---------------------|-------------------------------------------------------|--------|
|           |                         |                     | At each Term of Life. | Total. | Mortality per Cent. | Deaths that would have happened at each Term of Life. | Total. |
| 26 to 30  | 2198·0                  | 0·409               | 9                     | ...    | 0·998               | 21·9                                                  | ...    |
| 31 ... 35 | 2190·5                  | 0·639               | 14                    | 23     | 1·063               | 23·3                                                  | 45·2   |
| 36 ... 40 | 1353·5                  | 1·477               | 20                    | 43     | 1·157               | 15·7                                                  | 60·9   |
| 41 ... 45 | 811·5                   | 1·355               | 11                    | 54     | 1·319               | 10·7                                                  | 71·6   |
| 46 ... 50 | 578·5                   | 1·383               | 8                     | 62     | 1·560               | 9·0                                                   | 80·6   |
| 51 ... 55 | 410·0                   | 4·146               | 17                    | 79     | 1·935               | 7·9                                                   | 88·5   |
| 56 ... 60 | 200·0                   | 3·500               | 7                     | 86     | 2·529               | 5·1                                                   | 93·6   |
| 61 ... 65 | 74·0                    | 8·108               | 6                     | 92     | 3·474               | 2·6                                                   | 96·2   |
| 66 ... 70 | 18·0                    | 2·222               | 4                     | 96     | 4·947               | 0·9                                                   | 97·1   |
|           | 7834·0                  | 1·225               | 96                    | ...    | 1·239               | 97·1                                                  | ...    |



In vol. ix. of the Journal of this Society will be found an interesting paper by Dr. Guy, "On the Duration of Life in several Professions," distinguishing, among others, the Medical Profession. The results arrived at by Dr. Guy shew a somewhat greater mortality than that for the male population generally of this country. In vol. xvii. of the same Journal will be found another paper by Dr. Guy, "On the Duration of Life among Medical Men," founded on a larger body of facts. The results of his second inquiry however agree closely with those of the first, considering the nature of the data and the mode of investigation followed. There is also before the public the well-known body of facts collected by Professor Casper, of Berlin, and which exhibits a higher rate of mortality than even the results of Dr. Guy's paper; but it is only right to bear in mind that, however valuable these contributions may be considered, both collections of facts are defective in one very important element, namely, the number of medical men in the profession or class in which the deaths are recorded. Neither Dr. Guy nor Professor Casper had the means of ascertaining the amount of population in the respective groups in which the deaths recorded took place; but, under the circumstances, they have made the best possible use of the materials at their command. In the facts brought forward in this paper, however, it will be seen that the number of the living, both in the officers of the Medical Department of the Royal Army and among the members of the Royal Medical Chirurgical Society, is known, and therefore all the elements necessary to a complete inquiry into the duration of life in each of these classes are available. It could also be easily shewn that the effect of introducing the wanting element in Dr. Guy's inquiry would be to increase the duration of life assigned to the results he has arrived at, and thereby make the rate of mortality approximate more closely to those set forth in Abstracts K and M, preceding.

It is very satisfactory to find so near an agreement in the results of two independent inquiries, originating in so different a manner, and resting on so very different sources of information. But this coincidence only makes the results of the investigation into the duration of life among the officers of the Medical Department of the Army, as brought forward in the early part of this paper, the more remarkable and extraordinary.

It will be observed, that although a very complete analysis has been made of the social condition of life of the medical officers of the Royal Army, in order to arrive at the rate of mortality peculiar to those conditions, still no attempt has been made to determine the physical causes which it is evident prevail so powerfully in producing differences of mortality of so striking a nature as to be wholly without precedent in all former inquiries in the diversified field of Vital Statistics. It is proposed to reserve this more generally interesting part of the investigation for a future occasion.

It may, however, be now stated that the very high rate of mortality under the age of 54, but more particularly under the age of 40, as indicated by the results in all the Abstracts from A to F inclusive, had, in the first place, been supposed to arise from the



younger medical officers being probably sent to unhealthy stations. In order to test the merits of this hypothesis, an examination was permitted to be made of the records at the War-office, to determine the place of death; but of the 506 deaths given in Tables I and II, the place was found specified for only 308, and the following is a condensed Abstract of the results of this part of the inquiry.

### ABSTRACT N.

*Places at which 308 Members of the Royal Army Medical Fund have died, distinguishing the Age at time of Death.*

| Place of Death.           | Age at Death. |          |          |          |          |          |          |          |          |          |          |          |          | Total.     |            |            |
|---------------------------|---------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|------------|------------|------------|
|                           | 20 to 24      | 25 .. 29 | 30 .. 34 | 35 .. 39 | 40 .. 44 | 45 .. 49 | 50 .. 54 | 55 .. 59 | 60 .. 64 | 65 .. 69 | 70 .. 74 | 75 .. 79 | 80 .. 84 | To Age 40. | To Age 55. | To Age 84. |
| Great Britain and Ireland | 7             | 18       | 9        | 10       | 15       | 11       | 16       | 8        | 9        | 6        | 4        | 2        | 2        | 44         | 86         | 117        |
| Healthy Colonies .....    | 6             | 12       | 11       | 11       | 4        | 5        | 6        | 6        | 7        | 3        | ..       | ..       | ..       | 40         | 55         | 71         |
| Total .....               | 13            | 30       | 20       | 21       | 19       | 16       | 22       | 14       | 16       | 9        | 4        | 2        | 2        | 84         | 141        | 188        |
| The West Indies .....     | 7             | 14       | 9        | 8        | 6        | 6        | 1        | 2        | ..       | ..       | 1        | ..       | ..       | 38         | 51         | 54         |
| The East Indies .....     | 3             | 13       | 14       | 5        | 7        | 1        | 3        | 4        | 2        | ..       | ..       | ..       | ..       | 35         | 46         | 52         |
| Africa .....              | 5             | 4        | 4        | ..       | 1        | ..       | ..       | ..       | ..       | ..       | ..       | ..       | ..       | 13         | 14         | 14         |
| Total .....               | 15            | 31       | 27       | 13       | 14       | 7        | 4        | 6        | 2        | ..       | 1        | ..       | ..       | 86         | 111        | 120        |
| Grand Total .....         | 28            | 61       | 47       | 34       | 33       | 23       | 26       | 20       | 18       | 9        | 5        | 2        | 2        | 170        | 252        | 308        |

An inspection of the figures in this Abstract, will at once shew that the number of deaths which has taken place in unhealthy colonies, is not sufficient to account for the unprecedented amount of mortality under age 40. If the whole of the deaths in the three last groups of the preceding Abstract were excluded, the mortality assigned to the first and second groups would still be greatly in excess of that which under ordinary circumstances is experienced in this country, and other equally healthy places; in fact,



under the age of 35, the rate of mortality would, even after the elimination of the second section of Abstract N, be at least double that of the male population of England and Wales at the corresponding ages. On referring to the Abstract given in page 106, it will be seen that, even assuming the whole of the younger officers to have been constantly resident in India or in other equally trying climates, it would not be sufficient to account for the large number of deaths which has actually taken place. The extraordinary results appearing in this paper, cannot therefore be explained by the supposed influence of climate or residence in unhealthy colonies; and it is somewhat remarkable, that in the very able statistical reports prepared from the records of the Army Medical Department, and the War-office returns, no notice should be taken of facts so seriously affecting the medical officers of the service, and so much demanding inquiry and investigation.



## MORTALITY OF MASTER MARINERS.

---

The present contribution is brought under attention with the view of increasing our knowledge of the causes which affect the mortality of Master Mariners. Apart from the scientific considerations connected with this question as a branch of Vital Statistics, it is believed that its discussion will receive additional interest from the immediate and direct application of the results to the purposes of Life Assurance Institutions.

The first portion of the following materials has been collected from the records of the "Master Mariners' Society," enrolled under the Friendly Societies' Acts, and includes the experience of the Society for the fourteen years, 1835-48. The members consist exclusively of master mariners, and previous to admission, their health and habits undergo the scrutiny usually exercised by life offices and friendly societies. The benefits granted are of a twofold nature, the payments of specified sums of money on the death of the members, and a fixed rate of compensation in the event of the wreck or partial wreck of their vessels. The registers of the Society have been very accurately kept, and the following facts have been abstracted with great care by the secretary, on a schedule prepared for the purpose, and have been at three different times compared with the original books and examined by him, so that proper means have been taken to ensure accuracy.

The facts furnished by the secretary were then re-abstracted into other schedules in the following manner.

First. All the members entering the Society in each year were distinguished and placed in separate groups according to their ages on admission, and the subsequent contingencies to be observed were, with their dates, duly noted; in the event of the death of a member, the peculiar form and manner of death, and in the event of the wreck or injury of a vessel, the particulars were always noted, and those members who did not fall under any of the causes of death, or withdrawal from the Society, were in like manner noted. The summary, therefore, of this schedule shewed for the members entering in every year of the Society's existence, and for members of different ages, the results peculiar to each, and offered interesting means of comparison, and were therefore so collected into a second schedule, the summary of which shewed, irrespective of the period of admission, the casualties of different kinds happening at each term of life. The details of these schedules occupy so much space, that it is not proposed to bring them forward here, but at once to proceed to the following Table, No. I, on which they were



finally abstracted. The following notes will be sufficient to explain the construction of this Table.

Column (*a*) Represents the age at which the admission of each member, or other contingent event connected therewith, took place.

(*b*) The number of members admitted at each age.

(*c*) The number of members remaining under observation from each preceding age, and is the residue of all those entering in each preceding age, who have not become subject to any of the contingent events represented in the adjoining columns. For example, one member enters at the age of 19, and not falling under the events specified in the adjoining columns, he survives until the succeeding age, and comes under observation as a member of the age of 20.

(*d*) Again, two members enter at the age of 20, which, with the one remaining from the age of 19, make three, coming under observation at some time or other after completing the 19th year of their life, and before completing the 20th year, none of these become subject to any of the other events specified, and the whole three are therefore carried under observation to the following age, 21, when 15 other members entered, making 18 altogether under observation at the age of 21. Of these, one, recently entered, remains alive on the 31st December, 1848, and therefore passes from under observation at the age of 21, and consequently 17 only come under observation in the next year; but at the age of 22, there are 28 members more admitted, which, added to 17, causes 45 to fall under observation in the 22nd year of life. In like manner, 77 members in all come under observation at the age of 23. Of these, one is lost during the course of that year, and one retires, while one, who has recently entered, remains alive on the 31st December, 1848, and is, therefore, not longer observed; three members in all, therefore, go from under observation at the age of 23, and 74 are carried forward to the succeeding age of 24, which, with 43 admitted at that age, brings 117 members altogether under review at the age of 24.

(*e*) Represents the numbers dying at each age or term of life from natural causes.

(*f* to *k*), inclusive, Represent the numbers dying at each age or term of life from other causes.

(*l*) Shews the total of columns *e* to *k*, inclusive.

(*m*, *n*, *o*) Shew the wrecks and loss of property.

(*p*) Represents those who have retired under the prescribed regulations.

(*q*) Represents the number of members alive on the 31st December, 1848, and who have not become subject to any of the contingent events represented in columns *e* to *k*, inclusive, and also in *p*.

(*r*) Contains the total of columns *l*, *p*, and *q*, and represents the number of members which cease to come under observation in any of the more advanced ages. For example, at the age of 25, column *d* represents 169 coming under observation; but before attaining the 26th year of age, six of these pass from observation, leaving 163 to come under the 26th year of age, as shewn in column *c*.

(*s*) Represents one half of the numbers entering the Society at each year of life at which admissions take place, and is, therefore, one half of the numbers in column *b*. In like manner, column

(*t*) Represents one half the numbers in column *p*; and column

(*u*) The total of columns *s* and *t*; the purpose of these three columns will appear in the explanation of column

(*v*) Which represents the number of lives exposed a complete year to the risk of mortality from all causes while connected with the Society, and the figures in this column are produced by subtracting  
[from the



TABLE I.

Mortality from all Causes.

| Age.     | Number Entered at each Age. | Number remaining under Observation from Age preceding. | Total Number under Observation at each Age. | Deaths.  |          |                 |          |                   |               |          | Wrecks.  |                |          | Retired. | Alive.   | Total gone off. | Half Entered and Half Discontinued. |               |          | Number Exposed to Risk. |
|----------|-----------------------------|--------------------------------------------------------|---------------------------------------------|----------|----------|-----------------|----------|-------------------|---------------|----------|----------|----------------|----------|----------|----------|-----------------|-------------------------------------|---------------|----------|-------------------------|
|          |                             |                                                        |                                             | Died.    | Lost.    | Violent Deaths. | Drowned. | Washed overboard. | Hung himself. | Total.   | Wrecked. | Partial Wreck. | Fire.    |          |          |                 | Entered.                            | Discontinued. | Total.   |                         |
| <i>a</i> | <i>b</i>                    | <i>c</i>                                               | <i>d</i>                                    | <i>e</i> | <i>f</i> | <i>g</i>        | <i>h</i> | <i>i</i>          | <i>k</i>      | <i>l</i> | <i>m</i> | <i>n</i>       | <i>o</i> | <i>p</i> | <i>q</i> | <i>r</i>        | <i>s</i>                            | <i>t</i>      | <i>u</i> | <i>v</i>                |
| 19       | 1                           | ...                                                    | 1                                           | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | ...      | ...             | .5                                  | ...           | .5       | .5                      |
| 20       | 2                           | 1                                                      | 3                                           | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | ...      | ...             | 1                                   | ...           | 1        | 2                       |
| 21       | 15                          | 3                                                      | 18                                          | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | 1        | 1               | 7.5                                 | ...           | 7.5      | 10.5                    |
| 22       | 28                          | 17                                                     | 45                                          | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | ...      | ...             | 14                                  | ...           | 14       | 31                      |
| 23       | 32                          | 45                                                     | 77                                          | ...      | 1        | ...             | ...      | ...               | ...           | 1        | 1        | 1              | ...      | 1        | 1        | 3               | 16                                  | .5            | 16.5     | 60.5                    |
| 24       | 43                          | 74                                                     | 117                                         | 1        | 2        | ...             | ...      | ...               | ...           | 3        | 5        | 1              | ...      | 1        | 3        | 7               | 21.5                                | .5            | 22       | 95                      |
| 25       | 59                          | 110                                                    | 169                                         | 1        | 1        | ...             | ...      | ...               | ...           | 2        | 3        | 2              | ...      | 3        | 1        | 6               | 29.5                                | 1.5           | 31       | 138                     |
| 26       | 64                          | 163                                                    | 227                                         | 1        | 2        | ...             | 2        | 2                 | ...           | 7        | 5        | ...            | 1        | 3        | 6        | 16              | 32                                  | 1.5           | 33.5     | 193.5                   |
| 27       | 57                          | 211                                                    | 268                                         | 2        | ...      | ...             | ...      | ...               | ...           | 2        | 3        | 2              | ...      | 6        | 9        | 17              | 28.5                                | 3             | 31.5     | 236.5                   |
| 28       | 66                          | 251                                                    | 317                                         | 4        | 2        | ...             | ...      | ...               | ...           | 6        | 6        | 4              | ...      | 7        | 5        | 18              | 33                                  | 3.5           | 36.5     | 280.5                   |
| 29       | 60                          | 299                                                    | 359                                         | 5        | 3        | ...             | ...      | ...               | ...           | 8        | 4        | 2              | ...      | 9        | 11       | 28              | 30                                  | 4.5           | 34.5     | 324.5                   |
| 30       | 88                          | 331                                                    | 419                                         | 4        | 3        | ...             | 1        | ...               | ...           | 8        | 5        | 7              | ...      | 10       | 12       | 30              | 44                                  | 5             | 49       | 370                     |
| 31       | 54                          | 389                                                    | 443                                         | 2        | 2        | 1               | 1        | ...               | ...           | 6        | 8        | 5              | ...      | 9        | 28       | 43              | 27                                  | 4.5           | 31.5     | 411.5                   |
| 32       | 64                          | 400                                                    | 464                                         | 7        | 2        | ...             | 1        | 3                 | ...           | 13       | 11       | ...            | ...      | 12       | 41       | 66              | 32                                  | 6             | 38       | 426                     |
| 33       | 65                          | 398                                                    | 463                                         | 11       | ...      | ...             | 1        | ...               | ...           | 12       | 7        | 6              | ...      | 13       | 37       | 62              | 32.5                                | 6.5           | 39       | 424                     |
| 34       | 93                          | 401                                                    | 494                                         | 4        | 4        | ...             | 1        | ...               | ...           | 9        | 9        | 1              | ...      | 7        | 25       | 41              | 46.5                                | 3.5           | 50       | 444                     |
| 35       | 77                          | 453                                                    | 530                                         | 5        | 7        | ...             | 1        | ...               | ...           | 13       | 14       | 4              | 1        | 5        | 38       | 56              | 38.5                                | 2.5           | 41       | 489                     |
| 36       | 63                          | 474                                                    | 537                                         | 2        | 2        | 1               | 1        | 1                 | ...           | 7        | 12       | 3              | ...      | 15       | 33       | 55              | 31.5                                | 7.5           | 39       | 498                     |
| 37       | 59                          | 482                                                    | 541                                         | 7        | 1        | ...             | ...      | ...               | ...           | 8        | 10       | 5              | ...      | 11       | 57       | 76              | 29.5                                | 5.5           | 35       | 506                     |
| 38       | 77                          | 465                                                    | 542                                         | 11       | 2        | 1               | 1        | ...               | ...           | 15       | 14       | ...            | ...      | 8        | 41       | 64              | 38.5                                | 4             | 42.5     | 499.5                   |
| 39       | 70                          | 478                                                    | 548                                         | 6        | 1        | ...             | 2        | ...               | ...           | 9        | 9        | 3              | ...      | 10       | 35       | 54              | 35                                  | 5             | 40       | 508                     |
| 40       | 58                          | 494                                                    | 552                                         | 6        | 6        | 1               | 2        | 3                 | ...           | 18       | 12       | 5              | ...      | 9        | 44       | 71              | 29                                  | 4.5           | 33.5     | 518.5                   |
| 41       | 42                          | 481                                                    | 523                                         | 6        | 3        | 1               | ...      | 1                 | ...           | 11       | 7        | 9              | ...      | 11       | 47       | 69              | 21                                  | 5.5           | 26.5     | 496.5                   |
| 42       | 33                          | 454                                                    | 487                                         | 10       | ...      | ...             | 1        | ...               | ...           | 11       | 6        | 2              | ...      | 11       | 51       | 73              | 16.5                                | 5.5           | 22       | 465                     |
| 43       | 46                          | 414                                                    | 460                                         | 9        | 7        | ...             | 1        | ...               | ...           | 7        | 8        | 3              | ...      | 7        | 47       | 71              | 23                                  | 3.5           | 26.5     | 433.5                   |
| 44       | 44                          | 389                                                    | 433                                         | 6        | 1        | ...             | ...      | ...               | ...           | 7        | 11       | 3              | ...      | ...      | 43       | 50              | 22                                  | ...           | 22       | 411                     |
| 45       | 24                          | 383                                                    | 407                                         | 3        | ...      | ...             | 2        | 1                 | ...           | 6        | 3        | ...            | ...      | 10       | 43       | 59              | 12                                  | 5             | 17       | 390                     |
| 46       | 15                          | 348                                                    | 363                                         | 9        | 1        | ...             | 1        | ...               | ...           | 11       | 6        | 5              | 1        | 5        | 42       | 58              | 7.5                                 | 2.5           | 10       | 353                     |
| 47       | 24                          | 305                                                    | 329                                         | 3        | 1        | ...             | 1        | ...               | ...           | 5        | 2        | 4              | ...      | 9        | 54       | 68              | 12                                  | 4.5           | 16.5     | 312.5                   |
| 48       | 28                          | 261                                                    | 289                                         | 7        | 2        | ...             | ...      | ...               | ...           | 9        | 6        | ...            | ...      | 8        | 44       | 61              | 14                                  | 4             | 18       | 271                     |
| 49       | 28                          | 228                                                    | 256                                         | 5        | 1        | 1               | 1        | ...               | ...           | 8        | 2        | 1              | ...      | 2        | 36       | 46              | 14                                  | 1             | 15       | 241                     |
| 50       | 13                          | 210                                                    | 223                                         | 6        | 3        | 1               | ...      | ...               | 1             | 11       | 2        | 4              | ...      | 7        | 29       | 47              | 6.5                                 | 3.5           | 10       | 213                     |
| 51       | 4                           | 176                                                    | 180                                         | 3        | ...      | ...             | 1        | ...               | ...           | 4        | 6        | 1              | ...      | 5        | 21       | 30              | 2                                   | 2.5           | 4.5      | 175.5                   |
| 52       | 12                          | 150                                                    | 162                                         | 5        | 2        | ...             | 1        | ...               | ...           | 8        | 6        | 2              | ...      | 5        | 25       | 38              | 6                                   | 2.5           | 8.5      | 153.5                   |
| 53       | 15                          | 124                                                    | 139                                         | 1        | ...      | ...             | ...      | ...               | ...           | 1        | 3        | 1              | 1        | 7        | 13       | 21              | 7.5                                 | 3.5           | 11       | 128                     |
| 54       | 11                          | 118                                                    | 129                                         | ...      | ...      | ...             | ...      | 1                 | ...           | 1        | 3        | ...            | ...      | 2        | 18       | 21              | 5.5                                 | 1             | 6.5      | 122.5                   |
| 55       | 5                           | 108                                                    | 113                                         | 7        | ...      | ...             | ...      | ...               | ...           | 7        | ...      | 2              | 1        | 4        | 14       | 25              | 2.5                                 | 2             | 4.5      | 108.5                   |
| 56       | 4                           | 88                                                     | 92                                          | 1        | ...      | ...             | ...      | ...               | ...           | 1        | 1        | ...            | ...      | 4        | 10       | 15              | 2                                   | 2             | 4        | 88                      |
| 57       | ...                         | 77                                                     | 77                                          | 1        | ...      | ...             | ...      | ...               | ...           | 1        | 1        | ...            | ...      | 4        | 12       | 17              | ...                                 | 2             | 2        | 75                      |
| 58       | 3                           | 60                                                     | 63                                          | 1        | ...      | ...             | ...      | ...               | ...           | 1        | ...      | 1              | ...      | 2        | 8        | 11              | 1.5                                 | 1             | 2.5      | 60.5                    |
| 59       | ...                         | 52                                                     | 52                                          | 1        | ...      | ...             | ...      | ...               | ...           | 1        | ...      | ...            | ...      | 1        | 11       | 13              | ...                                 | .5            | .5       | 51.5                    |
| 60       | ...                         | ...                                                    | 39                                          | 2        | ...      | ...             | ...      | ...               | ...           | 2        | 1        | 1              | ...      | ...      | 12       | 14              | ...                                 | ...           | ...      | 39                      |
| 61       | ...                         | ...                                                    | 25                                          | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | 3        | 3               | ...                                 | ...           | ...      | 25                      |
| 62       | ...                         | ...                                                    | 22                                          | ...      | ...      | ...             | ...      | ...               | ...           | ...      | 1        | ...            | ...      | ...      | 5        | 5               | ...                                 | ...           | ...      | 22                      |
| 63       | ...                         | ...                                                    | 17                                          | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | 1        | 3        | 4               | ...                                 | .5            | .5       | 16.5                    |
| 64       | ...                         | ...                                                    | 13                                          | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | 5        | 5               | ...                                 | ...           | ...      | 13                      |
| 65       | ...                         | ...                                                    | 8                                           | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | 1        | 3        | 4               | ...                                 | .5            | .5       | 7.5                     |
| 66       | ...                         | ...                                                    | 4                                           | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | 2        | 2               | ...                                 | ...           | ...      | 4                       |
| 67       | ...                         | ...                                                    | 2                                           | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | 2        | 2               | ...                                 | ...           | ...      | 2                       |
| 68       | ...                         | ...                                                    | ...                                         | ...      | ...      | ...             | ...      | ...               | ...           | ...      | ...      | ...            | ...      | ...      | ...      | ...             | ...                                 | ...           | ...      | ...                     |
|          | 1,546                       |                                                        | 12,041                                      | 165      | 62       | 7               | 23       | 12                | 1             | 270      | 213      | 90             | 5        | 254      | 1,031    | 1,546           | 773.0                               | 122.5         | 895.5    | 11145.5                 |



from the numbers in column *d* the numbers in column *u*, opposite the same age. As already stated, column *d* contains the gross number under observation at some time or other throughout the year of life set forth in column *a*; but as column *b* contains for each age the numbers who have just entered the Society, and as members, one with another, enter at different periods throughout the year, it has been found, by observation, that, on an average, each is during the year of admission, exposed to only six months', or one half-year's mortality, and hence column *s* represents that amount of risk for all the members just admitted. In like manner, column *t* represents the amount of risk to which members retiring from the Society are exposed, on the hypothesis that, one with another, the discontinuances will take place in the middle of the year. It thus appears, that as column *u* is the total of *s* and *t*, that it shews the proper number to be deducted from the quantities in column *d*, in order to find the number exposed to the risk of a whole year's mortality.

From this Table, it will be seen that of 270 deaths, 165 only have taken place from natural causes, 62 were lost with their vessels, seven took place by violent means, such as falling of masts, and loss of life in engagements with pirates, 23 were drowned, 12 washed overboard, and one hung himself.

The following is a condensed Abstract of this Table, and represents the rate of mortality from all causes taking place among master mariners, at different periods of life.

ABSTRACT A.

| Age.       | Number exposed to<br>the Risk of Mortality<br>from all causes. | Died. | Mortality<br>per Cent. |
|------------|----------------------------------------------------------------|-------|------------------------|
| 19 to 20   | 2.5                                                            | ...   | ...                    |
| 21 ... 25  | 335.0                                                          | 6     | 1.791                  |
| 26 ... 30  | 1,405.0                                                        | 31    | 2.206                  |
| 31 ... 35  | 2,194.5                                                        | 53    | 2.415                  |
| 36 ... 40  | 2,530.0                                                        | 57    | 2.253                  |
| 41 ... 45  | 2,196.0                                                        | 52    | 2.368                  |
| 46 ... 50  | 1,390.5                                                        | 44    | 3.164                  |
| 51 ... 55  | 688.0                                                          | 21    | 3.052                  |
| 56 ... 60  | 314.0                                                          | 6     | 1.911                  |
| 61 ... 65  | 84.0                                                           | ...   | ...                    |
| 66 ... 68  | 6.0                                                            | ...   | ...                    |
| Total..... | 11,145.5                                                       | 270   | 2.423                  |

It will thus be seen that throughout the Table the rate of mortality is high; and attention is next directed to Table II, which exhibits the mortality that has taken place from natural causes only. In this Table, it will be observed that columns *a* to *e* inclusive, are exactly similar to the first five columns of Table I, but that the group of columns headed "discontinued," in Table II, consists of columns *f*, *g*, *h*, *i*, and *k*, of Table I, with the addition of *p*. The reason of this will immediately appear on reflection. In Table I, [the mortality



## Mortality from Natural Causes.

| Age.     | Number Entered at each Age. | Number remaining under Observation from Age preceding. | Total Number under Observation at each Age. | Discontinued. |          |                |          |                   |               |          |          | Alive.   | Total gone off. | Half Entered and Half Discontinued. |               |          | Number Exposed to Risk. |
|----------|-----------------------------|--------------------------------------------------------|---------------------------------------------|---------------|----------|----------------|----------|-------------------|---------------|----------|----------|----------|-----------------|-------------------------------------|---------------|----------|-------------------------|
|          |                             |                                                        |                                             | Died.         | Lost.    | Violent Death. | Drowned. | Washed overboard. | Hung himself. | Retired. | Total.   |          |                 | Entered.                            | Discontinued. | Total.   |                         |
| <i>a</i> | <i>b</i>                    | <i>c</i>                                               | <i>d</i>                                    | <i>e</i>      | <i>f</i> | <i>g</i>       | <i>h</i> | <i>i</i>          | <i>k</i>      | <i>l</i> | <i>m</i> | <i>n</i> | <i>o</i>        | <i>p</i>                            | <i>q</i>      | <i>r</i> | <i>s</i>                |
| 19       | 1                           | ..                                                     | 1                                           | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | ..       | ..              | .5                                  | ..            | .5       | .5                      |
| 20       | 2                           | 1                                                      | 3                                           | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | ..       | ..              | 1                                   | ..            | 1        | 2                       |
| 21       | 15                          | 3                                                      | 18                                          | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | 1        | 1               | 7.5                                 | ..            | 7.5      | 10.5                    |
| 22       | 28                          | 17                                                     | 45                                          | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | ..       | ..              | 14                                  | ..            | 14       | 31                      |
| 23       | 32                          | 45                                                     | 77                                          | ..            | 1        | ..             | ..       | ..                | ..            | 1        | 2        | 1        | 3               | 16                                  | 1             | 17       | 60                      |
| 24       | 43                          | 74                                                     | 117                                         | 1             | 2        | ..             | ..       | ..                | ..            | 1        | 3        | 3        | 7               | 21.5                                | 1.5           | 23       | 94                      |
| 25       | 59                          | 110                                                    | 169                                         | 1             | 1        | ..             | ..       | ..                | ..            | 3        | 4        | 1        | 6               | 29.5                                | 2             | 31.5     | 137.5                   |
| 26       | 64                          | 163                                                    | 226                                         | 1             | 2        | ..             | 2        | 2                 | ..            | 3        | 9        | 6        | 16              | 32                                  | 4.5           | 36.5     | 190.5                   |
| 27       | 57                          | 211                                                    | 268                                         | 2             | ..       | ..             | ..       | ..                | ..            | 6        | 6        | 9        | 17              | 28.5                                | 3             | 31.5     | 236.5                   |
| 28       | 66                          | 251                                                    | 317                                         | 4             | 2        | ..             | ..       | ..                | ..            | 7        | 9        | 5        | 18              | 33                                  | 4.5           | 37.5     | 279.5                   |
| 29       | 60                          | 299                                                    | 359                                         | 5             | 3        | ..             | ..       | ..                | ..            | 9        | 12       | 11       | 28              | 30                                  | 6             | 36       | 323                     |
| 30       | 88                          | 331                                                    | 419                                         | 4             | 3        | ..             | 1        | ..                | ..            | 10       | 14       | 12       | 30              | 44                                  | 7             | 51       | 368                     |
| 31       | 54                          | 389                                                    | 443                                         | 2             | 2        | 1              | 1        | ..                | ..            | 9        | 13       | 28       | 43              | 27                                  | 6.5           | 33.5     | 409.5                   |
| 32       | 64                          | 400                                                    | 464                                         | 7             | 2        | ..             | 1        | 3                 | ..            | 12       | 18       | 41       | 66              | 32                                  | 9             | 41       | 423                     |
| 33       | 65                          | 398                                                    | 463                                         | 11            | ..       | ..             | 1        | ..                | ..            | 13       | 14       | 37       | 62              | 32.5                                | 7             | 39.5     | 423.5                   |
| 34       | 93                          | 401                                                    | 494                                         | 4             | 4        | ..             | 1        | ..                | ..            | 7        | 12       | 25       | 41              | 46.5                                | 6             | 52.5     | 441.5                   |
| 35       | 77                          | 453                                                    | 530                                         | 5             | 7        | ..             | 1        | ..                | ..            | 5        | 13       | 38       | 56              | 38.5                                | 6.5           | 45       | 485                     |
| 36       | 63                          | 474                                                    | 537                                         | 2             | 2        | 1              | 1        | 1                 | ..            | 15       | 20       | 33       | 55              | 31.5                                | 10            | 41.5     | 495.5                   |
| 37       | 59                          | 482                                                    | 541                                         | 7             | 1        | ..             | ..       | ..                | ..            | 11       | 12       | 57       | 76              | 29.5                                | 6             | 35.5     | 505.5                   |
| 38       | 77                          | 465                                                    | 542                                         | 11            | 2        | 1              | 1        | ..                | ..            | 8        | 12       | 41       | 64              | 38.5                                | 6             | 44.5     | 497.5                   |
| 39       | 70                          | 478                                                    | 548                                         | 6             | 1        | ..             | 2        | ..                | ..            | 10       | 13       | 35       | 54              | 35                                  | 6.5           | 41.5     | 506.5                   |
| 40       | 58                          | 494                                                    | 552                                         | 6             | 6        | 1              | 2        | 3                 | ..            | 9        | 21       | 44       | 71              | 29                                  | 10.5          | 39.5     | 512.5                   |
| 41       | 42                          | 481                                                    | 523                                         | 6             | 3        | 1              | ..       | 1                 | ..            | 11       | 16       | 47       | 69              | 21                                  | 8             | 29       | 494                     |
| 42       | 33                          | 454                                                    | 487                                         | 10            | ..       | ..             | 1        | ..                | ..            | 11       | 12       | 51       | 73              | 16.5                                | 6             | 22.5     | 464.5                   |
| 43       | 46                          | 414                                                    | 460                                         | 9             | 7        | ..             | 1        | ..                | ..            | 7        | 15       | 47       | 71              | 23                                  | 7.5           | 30.5     | 420.5                   |
| 44       | 44                          | 389                                                    | 433                                         | 6             | 1        | ..             | ..       | ..                | ..            | ..       | 1        | 43       | 50              | 22                                  | .5            | 22.5     | 410.5                   |
| 45       | 24                          | 383                                                    | 407                                         | 3             | ..       | ..             | 2        | 1                 | ..            | 10       | 13       | 43       | 59              | 12                                  | 6.5           | 18.5     | 388.5                   |
| 46       | 15                          | 348                                                    | 363                                         | 9             | 1        | ..             | 1        | ..                | ..            | 5        | 7        | 42       | 58              | 7.5                                 | 3.5           | 11       | 352                     |
| 47       | 24                          | 305                                                    | 329                                         | 3             | 1        | ..             | 1        | ..                | ..            | 9        | 11       | 54       | 68              | 12                                  | 5.5           | 17.5     | 311.5                   |
| 48       | 28                          | 261                                                    | 289                                         | 7             | 2        | ..             | ..       | ..                | ..            | 8        | 10       | 44       | 61              | 14                                  | 5             | 19       | 270                     |
| 49       | 28                          | 228                                                    | 256                                         | 5             | 1        | 1              | 1        | ..                | ..            | 2        | 5        | 36       | 46              | 14                                  | 2.5           | 16.5     | 239.5                   |
| 50       | 13                          | 210                                                    | 223                                         | 6             | 3        | 1              | ..       | ..                | 1             | 7        | 12       | 29       | 47              | 6.5                                 | 6             | 12.5     | 210.5                   |
| 51       | 4                           | 176                                                    | 180                                         | 3             | ..       | ..             | 1        | ..                | ..            | 5        | 6        | 21       | 30              | 2                                   | 3             | 5        | 175                     |
| 52       | 12                          | 150                                                    | 162                                         | 5             | 2        | ..             | 1        | ..                | ..            | 5        | 8        | 25       | 38              | 6                                   | 4             | 10       | 152                     |
| 53       | 15                          | 124                                                    | 139                                         | 1             | ..       | ..             | ..       | ..                | ..            | 7        | 7        | 13       | 21              | 7.5                                 | 3.5           | 11       | 128                     |
| 54       | 11                          | 118                                                    | 129                                         | ..            | ..       | ..             | ..       | 1                 | ..            | 2        | 3        | 18       | 21              | 5.5                                 | 1.5           | 7        | 122                     |
| 55       | 5                           | 108                                                    | 113                                         | 7             | ..       | ..             | ..       | ..                | ..            | 4        | 3        | 14       | 25              | 2.5                                 | 2             | 4.5      | 108.5                   |
| 56       | 4                           | 88                                                     | 92                                          | 1             | ..       | ..             | ..       | ..                | ..            | 4        | 3        | 10       | 15              | 2                                   | 2             | 4        | 88                      |
| 57       | ..                          | 77                                                     | 77                                          | 1             | ..       | ..             | ..       | ..                | ..            | 4        | 3        | 12       | 17              | ..                                  | 2             | 2        | 75                      |
| 58       | 3                           | 60                                                     | 63                                          | 1             | ..       | ..             | ..       | ..                | ..            | 2        | 2        | 8        | 11              | 1.5                                 | 1             | 2.5      | 60.5                    |
| 59       | ..                          | 52                                                     | 52                                          | 1             | ..       | ..             | ..       | ..                | ..            | 1        | 1        | 11       | 13              | ..                                  | .5            | .5       | 51.5                    |
| 60       | ..                          | ..                                                     | 30                                          | 2             | ..       | ..             | ..       | ..                | ..            | ..       | ..       | 12       | 14              | ..                                  | ..            | ..       | 39                      |
| 61       | ..                          | ..                                                     | 25                                          | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | 3        | 3               | ..                                  | ..            | ..       | 25                      |
| 62       | ..                          | ..                                                     | 22                                          | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | 5        | 5               | ..                                  | ..            | ..       | 22                      |
| 63       | ..                          | ..                                                     | 17                                          | ..            | ..       | ..             | ..       | ..                | ..            | 1        | 1        | 3        | 4               | ..                                  | .5            | .5       | 16.5                    |
| 64       | ..                          | ..                                                     | 13                                          | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | 5        | 5               | ..                                  | ..            | ..       | 13                      |
| 65       | ..                          | ..                                                     | 8                                           | ..            | ..       | ..             | ..       | ..                | ..            | 1        | 1        | 3        | 4               | ..                                  | .5            | .5       | 7.5                     |
| 66       | ..                          | ..                                                     | 4                                           | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | 2        | 2               | ..                                  | ..            | ..       | 4                       |
| 67       | ..                          | ..                                                     | 2                                           | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | 2        | 2               | ..                                  | ..            | ..       | 2                       |
| 68       | ..                          | ..                                                     | ..                                          | ..            | ..       | ..             | ..       | ..                | ..            | ..       | ..       | ..       | ..              | ..                                  | ..            | ..       | ..                      |
|          | 1,546                       |                                                        | 12,041                                      | 165           | 62       | 7              | 23       | 12                | 1             | 245      | 350      | 1,031    | 1,546           | 773.0                               | 175.0         | 948.0    | 11093.0                 |



the mortality from all causes was considered, and, therefore, in the determination of the number exposed to risk, the members retiring or withdrawing from the Society, only come under the head of "discontinued," but in Table II, the mortality from natural causes only is to be measured, and, therefore, the "discontinued" group will consist not only of the retired members, but also of those withdrawing or removing from the Society by all other causes, except natural death; consequently column *s* is found by deducting from column *d* the sum of columns *p* and *q*, or column *r*. The rest of Table II will be sufficiently understood by what has been said of Table I.

The following Abstract of this Table will make the results better understood.

ABSTRACT B.

| Ages.      | Number exposed to the risk of Mortality from natural causes. | Died. | Mortality per Cent. |
|------------|--------------------------------------------------------------|-------|---------------------|
| 19 to 20   | 2.5                                                          | ...   | ...                 |
| 21 ... 25  | 333.0                                                        | 2     | .600                |
| 26 ... 30  | 1,397.5                                                      | 16    | 1.145               |
| 31 ... 35  | 2,182.5                                                      | 29    | 1.324               |
| 36 ... 40  | 2,517.5                                                      | 32    | 1.231               |
| 41 ... 45  | 2,187.0                                                      | 34    | 1.555               |
| 46 ... 50  | 1,383.5                                                      | 30    | 2.168               |
| 51 ... 55  | 685.5                                                        | 16    | 2.480               |
| 56 ... 60  | 314.0                                                        | 6     | 1.910               |
| 61 ... 65  | 84.0                                                         | ...   | ...                 |
| 66 ... 68  | 6.0                                                          | ...   | ...                 |
| Total..... | 11,093.0                                                     | 165   | 1.488               |

The preceding, which shews the rate of mortality from natural causes, will be found to be much above that for the male population of the country generally at the same ages.

The next part of this subject to be considered, is the rate of mortality from accidental causes, or rather those causes peculiar to the occupation of master mariners. Table III gives those results, and it will on consideration soon appear that in this instance the "discontinued" group must, for like reasons to those assigned in explanation of Table II, consist of the members who have died from natural causes, and those who have retired from the Society, that is, the numbers composing columns *e* and *p* of Table I. It will thus be found, that in Tables I, II, and III, the numbers exposed to the risk of mortality differ, and this arises from the fact that the peculiar contingency to be measured is different in each instance, and, hence, the difference of the quantities forming the last column of each Table. Table I measures the sum of the force of the two causes prevailing in each of the other two Tables, and, therefore, the greater number exposed to risk.

[The following



TABLE III.

## Mortality from Accidental Causes.

| Age.     | Number Entered at each Age. | Number remaining under Observation from Age preceding. | Total Number under Observation at each Age. | Discontinued. |          |          | Deaths.  |                |          |                   |               |          | Alive.   | Total gone off. | Half Entered and Half Discontinued. |               |          | Number Exposed to Risk. |
|----------|-----------------------------|--------------------------------------------------------|---------------------------------------------|---------------|----------|----------|----------|----------------|----------|-------------------|---------------|----------|----------|-----------------|-------------------------------------|---------------|----------|-------------------------|
|          |                             |                                                        |                                             | Died.         | Retired. | Total.   | Lost.    | Violent Death. | Drowned. | Washed overboard. | Hung himself. | Total.   |          |                 | Entered.                            | Discontinued. | Total.   |                         |
| <i>a</i> | <i>b</i>                    | <i>c</i>                                               | <i>d</i>                                    | <i>e</i>      | <i>f</i> | <i>g</i> | <i>h</i> | <i>i</i>       | <i>k</i> | <i>l</i>          | <i>m</i>      | <i>n</i> | <i>o</i> | <i>p</i>        | <i>q</i>                            | <i>r</i>      | <i>s</i> | <i>t</i>                |
| 19       | 1                           | ..                                                     | 1                                           | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | ..       | ..              | ..5                                 | ..            | ..5      | ..5                     |
| 20       | 2                           | 1                                                      | 3                                           | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | ..       | ..              | 1                                   | ..            | 1        | 2                       |
| 21       | 15                          | 3                                                      | 18                                          | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | 1        | 1               | 7.5                                 | ..            | 7.5      | 10.5                    |
| 22       | 28                          | 17                                                     | 45                                          | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | ..       | ..              | 14                                  | ..            | 14       | 31                      |
| 23       | 32                          | 45                                                     | 77                                          | ..            | 1        | 1        | 1        | ..             | ..       | ..                | ..            | 1        | 1        | 3               | 16                                  | .5            | 16.5     | 60.5                    |
| 24       | 43                          | 74                                                     | 117                                         | 1             | 1        | 2        | 2        | ..             | ..       | ..                | ..            | 2        | 3        | 7               | 21.5                                | 1             | 22.5     | 94.5                    |
| 25       | 59                          | 110                                                    | 169                                         | 1             | 3        | 4        | 1        | ..             | ..       | ..                | ..            | 1        | 1        | 6               | 29.5                                | 2             | 31.5     | 137.5                   |
| 26       | 64                          | 163                                                    | 227                                         | 1             | 3        | 4        | 2        | ..             | 2        | 2                 | ..            | 6        | 6        | 16              | 32                                  | 2             | 34       | 193                     |
| 27       | 57                          | 211                                                    | 268                                         | 2             | 6        | 8        | ..       | ..             | ..       | ..                | ..            | ..       | 9        | 17              | 28.5                                | 4             | 32.5     | 235.5                   |
| 28       | 66                          | 251                                                    | 217                                         | 4             | 7        | 11       | 2        | ..             | ..       | ..                | ..            | 2        | 5        | 18              | 33                                  | 5.5           | 38.5     | 278.5                   |
| 29       | 60                          | 299                                                    | 359                                         | 5             | 9        | 14       | 3        | ..             | ..       | ..                | ..            | 3        | 11       | 28              | 30                                  | 7             | 37       | 322                     |
| 30       | 88                          | 331                                                    | 419                                         | 4             | 10       | 14       | 3        | ..             | 1        | ..                | ..            | 4        | 12       | 30              | 44                                  | 7             | 51       | 368                     |
| 31       | 54                          | 389                                                    | 443                                         | 2             | 9        | 11       | 2        | 1              | 1        | ..                | ..            | 4        | 28       | 43              | 27                                  | 5.5           | 32.5     | 410.5                   |
| 32       | 64                          | 400                                                    | 464                                         | 7             | 12       | 19       | 2        | ..             | 1        | 3                 | ..            | 6        | 41       | 66              | 32                                  | 9.5           | 41.5     | 422.5                   |
| 33       | 65                          | 398                                                    | 463                                         | 11            | 13       | 24       | ..       | ..             | 1        | ..                | ..            | 1        | 37       | 62              | 32.5                                | 12            | 44.5     | 418.5                   |
| 34       | 93                          | 401                                                    | 494                                         | 4             | 7        | 11       | 4        | ..             | 1        | ..                | ..            | 5        | 25       | 41              | 46.5                                | 5.5           | 52       | 442                     |
| 35       | 77                          | 453                                                    | 530                                         | 5             | 5        | 10       | 7        | ..             | 1        | ..                | ..            | 8        | 38       | 56              | 38.5                                | 5             | 43.5     | 486.5                   |
| 36       | 63                          | 474                                                    | 537                                         | 2             | 15       | 17       | 2        | 1              | 1        | 1                 | ..            | 5        | 33       | 55              | 31.5                                | 8.5           | 40       | 497                     |
| 37       | 59                          | 482                                                    | 541                                         | 7             | 11       | 18       | 1        | ..             | ..       | ..                | ..            | 1        | 57       | 76              | 29.5                                | 9             | 38.5     | 502.5                   |
| 38       | 77                          | 465                                                    | 542                                         | 11            | 8        | 19       | 2        | 1              | 1        | ..                | ..            | 4        | 41       | 64              | 38.5                                | 9.5           | 48       | 494                     |
| 39       | 70                          | 478                                                    | 548                                         | 6             | 10       | 16       | 1        | ..             | 2        | ..                | ..            | 3        | 35       | 54              | 35                                  | 8             | 43       | 505                     |
| 40       | 58                          | 494                                                    | 552                                         | 6             | 9        | 15       | 6        | 1              | 2        | 3                 | ..            | 12       | 44       | 71              | 29                                  | 7.5           | 36.5     | 515.5                   |
| 41       | 42                          | 481                                                    | 523                                         | 6             | 11       | 17       | 3        | 1              | ..       | 1                 | ..            | 5        | 47       | 69              | 21                                  | 8.5           | 29.5     | 493.5                   |
| 42       | 33                          | 454                                                    | 487                                         | 10            | 11       | 21       | ..       | ..             | 1        | ..                | ..            | 1        | 51       | 73              | 16.5                                | 10.5          | 27       | 460                     |
| 43       | 46                          | 414                                                    | 460                                         | 9             | 7        | 16       | 7        | ..             | 1        | ..                | ..            | 8        | 47       | 71              | 23                                  | 8             | 31       | 429                     |
| 44       | 44                          | 389                                                    | 433                                         | 6             | ..       | 6        | 1        | ..             | ..       | ..                | ..            | 1        | 43       | 50              | 22                                  | 3             | 25       | 408                     |
| 45       | 24                          | 383                                                    | 407                                         | 3             | 10       | 13       | ..       | ..             | 2        | 1                 | ..            | 3        | 43       | 59              | 12                                  | 6.5           | 18.5     | 388.5                   |
| 46       | 15                          | 348                                                    | 363                                         | 9             | 5        | 14       | 1        | ..             | 1        | ..                | ..            | 2        | 42       | 58              | 7.5                                 | 7             | 14.5     | 348.5                   |
| 47       | 24                          | 305                                                    | 329                                         | 3             | 9        | 12       | 1        | ..             | 1        | ..                | ..            | 2        | 54       | 68              | 12                                  | 6             | 18       | 311                     |
| 48       | 28                          | 261                                                    | 289                                         | 7             | 8        | 15       | 2        | ..             | ..       | ..                | ..            | 2        | 44       | 61              | 14                                  | 7.5           | 21.5     | 267.5                   |
| 49       | 28                          | 228                                                    | 256                                         | 5             | 2        | 7        | 1        | 1              | 1        | ..                | ..            | 3        | 36       | 46              | 14                                  | 3.5           | 17.5     | 238.5                   |
| 50       | 13                          | 210                                                    | 223                                         | 6             | 7        | 13       | 3        | 1              | ..       | ..                | 1             | 5        | 29       | 47              | 6.5                                 | 6.5           | 13       | 210                     |
| 51       | 4                           | 176                                                    | 180                                         | 3             | 5        | 8        | ..       | ..             | 1        | ..                | ..            | 1        | 21       | 30              | 2                                   | 4             | 6        | 174                     |
| 52       | 12                          | 150                                                    | 162                                         | 5             | 5        | 10       | 2        | ..             | 1        | ..                | ..            | 3        | 25       | 38              | 6                                   | 5             | 11       | 151                     |
| 53       | 15                          | 124                                                    | 139                                         | 1             | 7        | 8        | ..       | ..             | ..       | ..                | ..            | ..       | 13       | 21              | 7.5                                 | 4             | 11.5     | 127.5                   |
| 54       | 11                          | 118                                                    | 129                                         | ..            | 2        | 2        | ..       | ..             | ..       | 1                 | ..            | 1        | 18       | 21              | 5.5                                 | 1             | 6.5      | 122.5                   |
| 55       | 5                           | 108                                                    | 113                                         | 7             | 4        | 11       | ..       | ..             | ..       | ..                | ..            | ..       | 14       | 25              | 2.5                                 | 5.5           | 8        | 105                     |
| 56       | 4                           | 88                                                     | 92                                          | 1             | 4        | 5        | ..       | ..             | ..       | ..                | ..            | ..       | 10       | 15              | 2                                   | 2.5           | 4.5      | 87.5                    |
| 57       | ..                          | 77                                                     | 77                                          | 1             | 4        | 5        | ..       | ..             | ..       | ..                | ..            | ..       | 12       | 17              | ..                                  | 2.5           | 2.5      | 74.5                    |
| 58       | 3                           | 60                                                     | 63                                          | 1             | 2        | 3        | ..       | ..             | ..       | ..                | ..            | ..       | 8        | 11              | 1.5                                 | 1.5           | 3        | 60                      |
| 59       | ..                          | 52                                                     | 52                                          | 1             | 1        | 2        | ..       | ..             | ..       | ..                | ..            | ..       | 11       | 13              | ..                                  | 1             | 1        | 51                      |
| 60       | ..                          | ..                                                     | 39                                          | 2             | ..       | 2        | ..       | ..             | ..       | ..                | ..            | ..       | 12       | 14              | ..                                  | 1             | 1        | 38                      |
| 61       | ..                          | ..                                                     | 25                                          | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | 3        | 3               | ..                                  | ..            | ..       | 25                      |
| 62       | ..                          | ..                                                     | 22                                          | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | 5        | 5               | ..                                  | ..            | ..       | 22                      |
| 63       | ..                          | ..                                                     | 17                                          | ..            | 1        | 1        | ..       | ..             | ..       | ..                | ..            | ..       | 3        | 4               | ..                                  | .5            | .5       | 16.5                    |
| 64       | ..                          | ..                                                     | 13                                          | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | 5        | 5               | ..                                  | ..            | ..       | 13                      |
| 65       | ..                          | ..                                                     | 8                                           | ..            | 1        | 1        | ..       | ..             | ..       | ..                | ..            | ..       | 3        | 4               | ..                                  | .5            | .5       | 7.5                     |
| 66       | ..                          | ..                                                     | 4                                           | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | 2        | 2               | ..                                  | ..            | ..       | 4                       |
| 67       | ..                          | ..                                                     | 2                                           | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | 2        | 2               | ..                                  | ..            | ..       | 2                       |
| 68       | ..                          | ..                                                     | ..                                          | ..            | ..       | ..       | ..       | ..             | ..       | ..                | ..            | ..       | ..       | ..              | ..                                  | ..            | ..       | ..                      |
|          | 1,546                       |                                                        | 12,041                                      | 165           | 245      | 410      | 62       | 7              | 23       | 12                | 1             | 105      | 1,031    | 1,546           | 773.0                               | 205.0         | 978.0    | 11093.0                 |



The following Abstract of this Table shews that in each of the three earlier quinquennial periods of life, the mortality from accidental causes is greater than in the more advanced periods of life, and should more extended inquiries confirm these results, it would be a curious circumstance to know that advanced years and increased experience enable master mariners to avoid many of the causes which occasion loss of life. There are many ways in which amongst more experienced captains this immunity from death may be accounted for, such as being in the command of a high class of vessels: but it is quite unnecessary to speculate on the cause.

## ABSTRACT C.

| Ages.      | Number exposed to the risk of Death from accidental causes. | Died. | Mortality per Cent. |
|------------|-------------------------------------------------------------|-------|---------------------|
| 19 to 20   | 2.5                                                         | ..    | ..                  |
| 21 .. 25   | 334.0                                                       | 4     | 1.197               |
| 26 .. 30   | 1,397.0                                                     | 15    | 1.074               |
| 31 .. 35   | 2,180.0                                                     | 24    | 1.101               |
| 36 .. 40   | 2,514.0                                                     | 25    | .995                |
| 41 .. 45   | 2,179.0                                                     | 18    | .826                |
| 46 .. 50   | 1,375.5                                                     | 14    | 1.018               |
| 51 .. 55   | 680.0                                                       | 5     | .737                |
| 56 .. 60   | 311.0                                                       | ..    | ..                  |
| 61 .. 65   | 84.0                                                        | ..    | .                   |
| 66 .. 68   | 6.0                                                         | ..    | ..                  |
| Total..... | 11,063.0                                                    | 105   | 0.949               |

Having thus determined the ratio of the loss of life from the various causes among master mariners, it may be interesting to shew the relation between the actual number of deaths, which has taken place from each of these causes, and that which would have happened, had the number of deaths been the same as among the male population of England and Wales, at the same ages.



## ABSTRACT D.

| Ages.      | Number of Deaths from  |                                       |                        |                                       |
|------------|------------------------|---------------------------------------|------------------------|---------------------------------------|
|            | All Causes.            |                                       | Natural Causes.        |                                       |
|            | Among Master Mariners. | Male Population of England and Wales. | Among Master Mariners. | Male Population of England and Wales. |
| 19 to 20   | 0                      | ·019                                  | 0                      | ·019                                  |
| 21 ... 25  | 6                      | 2·935                                 | 2                      | 2·917                                 |
| 26 ... 30  | 31                     | 14·022                                | 16                     | 13·947                                |
| 31 ... 35  | 53                     | 23·328                                | 29                     | 23·130                                |
| 36 ... 40  | 57                     | 29·272                                | 32                     | 29·133                                |
| 41 ... 45  | 52                     | 28·965                                | 34                     | 28·847                                |
| 46 ... 50  | 44                     | 21·692                                | 30                     | 21·583                                |
| 51 ... 55  | 21                     | 13·313                                | 16                     | 13·264                                |
| 56 ... 60  | 6                      | 7·943                                 | 6                      | 7·943                                 |
| 61 ... 65  | ...                    | 2·918                                 | ...                    | 2·918                                 |
| 66 ... 68  | ...                    | ·276                                  | ...                    | ·276                                  |
| Total..... | 270                    | 144·683                               | 165                    | 143·977                               |

Hence, it appears, that while from all causes 270 deaths happened in the Master Mariners' Society, the number of deaths which would have happened according to the mortality of the male population of England and Wales, as taken from p. 5, *ante*, is 144·683, being an increased mortality of upwards of 86 per cent., but if the mortality between the ages 21 and 60 only be taken, the increase is 90 per cent.

Again, the same Abstract shews that while the mortality from natural causes was 165, the mortality according to the ratio for England and Wales was 143·977, being a difference of about 14·5 per cent., and if ages 21 to 60 only be included, the increase is about 18 per cent. This result certainly goes against the generally received opinion, that the deaths of mariners from natural causes only, is less than in the community generally, and shews the necessity of being very careful before drawing conclusions in the absence of clearly recorded and well analysed facts. There is no doubt that many inferences may be drawn from the data here presented, applicable to some of the questions at present agitated, in regard to the health of towns, and the sanitary condition of different districts, but as these speculations do not directly bear on the subject now under consideration, they had better not be at this place entered upon.

Table IV has been prepared in order to shew whether the age, and, therefore, as a general rule, the experience of captains of vessels, has any, and what influence on the losses of property under their charge. In this Table the "discontinued group" will consist of all causes of removal from the Society, whether by death or otherwise, as vessels could not be considered under the charge of members for an entire year, unless they were, without any interruption, members of the Society for the whole term of that year, and, therefore, if death or any other cause removed them from the Society in the course of the year, a correction must be applied, as in column *p*, on that account.

[Of the



TABLE IV.  
*Risk of Wrecks.*

| Age.     | Number Entered at each Age. | Number under Observation from Age preceding | Total Number under Observation at each Age. | Wrecks.  |                 |                       |          | Discontinued. |          |          |          | Half Entered and Half Discontinued. |               |          | Number Exposed to Risk. |
|----------|-----------------------------|---------------------------------------------|---------------------------------------------|----------|-----------------|-----------------------|----------|---------------|----------|----------|----------|-------------------------------------|---------------|----------|-------------------------|
|          |                             |                                             |                                             | Wrecks.  | Partial Wrecks. | Partial Loss by Fire. | Total.   | Deaths.       | Retired. | Alive.   | Total.   | Entered.                            | Discontinued. | Total.   |                         |
| <i>a</i> | <i>b</i>                    | <i>c</i>                                    | <i>d</i>                                    | <i>e</i> | <i>f</i>        | <i>g</i>              | <i>h</i> | <i>i</i>      | <i>k</i> | <i>l</i> | <i>m</i> | <i>n</i>                            | <i>o</i>      | <i>p</i> | <i>q</i>                |
| 19       | 1                           | ..                                          | 1                                           | ..       | ..              | ..                    | ..       | ..            | ..       | ..       | ..       | ..5                                 | ..            | ..5      | ..5                     |
| 20       | 2                           | 1                                           | 3                                           | ..       | ..              | ..                    | ..       | ..            | ..       | ..       | ..       | 1                                   | ..            | 1        | 2                       |
| 21       | 15                          | 3                                           | 18                                          | ..       | ..              | ..                    | ..       | ..            | ..       | 1        | 1        | 7.5                                 | ..5           | 8        | 10                      |
| 22       | 28                          | 17                                          | 45                                          | ..       | ..              | ..                    | ..       | ..            | ..       | ..       | ..       | 14                                  | ..            | 14       | 31                      |
| 23       | 32                          | 45                                          | 77                                          | 1        | 1               | ..                    | 2        | 1             | 1        | 1        | 3        | 16                                  | 1.5           | 17.5     | 59.5                    |
| 24       | 43                          | 74                                          | 117                                         | 5        | 1               | ..                    | 6        | 3             | 1        | 3        | 7        | 21.5                                | 3.5           | 25       | 92                      |
| 25       | 59                          | 110                                         | 169                                         | 3        | 2               | ..                    | 5        | 2             | 3        | 1        | 6        | 29.5                                | 3             | 32.5     | 136.5                   |
| 26       | 64                          | 163                                         | 227                                         | 5        | ..              | 1                     | 6        | 7             | 3        | 6        | 16       | 32                                  | 8             | 40       | 187                     |
| 27       | 57                          | 211                                         | 268                                         | 3        | 2               | ..                    | 5        | 2             | 6        | 9        | 17       | 28.5                                | 8.5           | 37       | 231                     |
| 28       | 66                          | 251                                         | 317                                         | 6        | 4               | ..                    | 10       | 6             | 7        | 5        | 18       | 33                                  | 9             | 42       | 275                     |
| 29       | 60                          | 299                                         | 359                                         | 4        | 2               | ..                    | 6        | 8             | 9        | 11       | 28       | 30                                  | 14            | 44       | 315                     |
| 30       | 88                          | 331                                         | 419                                         | 5        | 7               | ..                    | 12       | 8             | 10       | 12       | 30       | 44                                  | 15            | 59       | 360                     |
| 31       | 54                          | 389                                         | 443                                         | 8        | 5               | ..                    | 13       | 6             | 9        | 28       | 43       | 27                                  | 21.5          | 48.5     | 394.5                   |
| 32       | 64                          | 400                                         | 464                                         | 11       | ..              | ..                    | 11       | 13            | 12       | 41       | 66       | 32                                  | 33            | 65       | 399                     |
| 33       | 65                          | 398                                         | 463                                         | 7        | 6               | ..                    | 13       | 12            | 13       | 37       | 62       | 32.5                                | 31            | 63.5     | 399.5                   |
| 34       | 93                          | 401                                         | 494                                         | 9        | 1               | ..                    | 10       | 9             | 7        | 25       | 41       | 46.5                                | 20.5          | 67       | 427                     |
| 35       | 77                          | 453                                         | 530                                         | 14       | 4               | 1                     | 19       | 13            | 5        | 38       | 56       | 38.5                                | 28            | 66.5     | 463.5                   |
| 36       | 63                          | 474                                         | 537                                         | 12       | 3               | ..                    | 15       | 7             | 15       | 33       | 55       | 31.5                                | 27.5          | 59       | 478                     |
| 37       | 59                          | 482                                         | 541                                         | 10       | 5               | ..                    | 15       | 8             | 11       | 57       | 76       | 29.5                                | 38            | 67.5     | 473.5                   |
| 38       | 77                          | 465                                         | 542                                         | 14       | ..              | ..                    | 14       | 15            | 8        | 41       | 64       | 38.5                                | 32            | 70.5     | 471.5                   |
| 39       | 70                          | 478                                         | 548                                         | 9        | 3               | ..                    | 12       | 9             | 10       | 35       | 54       | 35                                  | 27            | 62       | 486                     |
| 40       | 58                          | 494                                         | 552                                         | 12       | 5               | ..                    | 17       | 18            | 9        | 44       | 71       | 29                                  | 35.5          | 64.5     | 487.5                   |
| 41       | 42                          | 481                                         | 523                                         | 7        | 9               | ..                    | 16       | 11            | 11       | 47       | 69       | 21                                  | 34.5          | 55.5     | 467.5                   |
| 42       | 33                          | 454                                         | 487                                         | 6        | 2               | ..                    | 8        | 11            | 11       | 51       | 73       | 16.5                                | 36.5          | 53       | 434                     |
| 43       | 46                          | 414                                         | 460                                         | 8        | 3               | ..                    | 11       | 17            | 7        | 47       | 71       | 23                                  | 35.5          | 58.5     | 401.5                   |
| 44       | 44                          | 389                                         | 433                                         | 11       | 3               | ..                    | 14       | 7             | ..       | 43       | 50       | 22                                  | 25            | 47       | 386                     |
| 45       | 24                          | 383                                         | 407                                         | 3        | ..              | ..                    | 3        | 6             | 10       | 43       | 59       | 12                                  | 29.5          | 41.5     | 365.5                   |
| 46       | 15                          | 348                                         | 363                                         | 6        | 5               | 1                     | 12       | 11            | 5        | 42       | 58       | 7.5                                 | 29            | 36.5     | 326.5                   |
| 47       | 24                          | 305                                         | 329                                         | 2        | 4               | ..                    | 6        | 5             | 9        | 54       | 68       | 12                                  | 34            | 46       | 283                     |
| 48       | 28                          | 261                                         | 289                                         | 6        | ..              | ..                    | 6        | 9             | 8        | 44       | 61       | 14                                  | 30.5          | 44.5     | 244.5                   |
| 49       | 28                          | 228                                         | 256                                         | 2        | 1               | ..                    | 3        | 8             | 2        | 36       | 46       | 14                                  | 23            | 37       | 219                     |
| 50       | 13                          | 210                                         | 223                                         | 2        | 4               | ..                    | 6        | 11            | 7        | 29       | 47       | 6.5                                 | 23.5          | 30       | 193                     |
| 51       | 4                           | 176                                         | 180                                         | 6        | 1               | ..                    | 7        | 4             | 5        | 21       | 30       | 2                                   | 15            | 17       | 163                     |
| 52       | 12                          | 150                                         | 160                                         | 6        | 2               | ..                    | 8        | 8             | 5        | 25       | 38       | 6                                   | 19            | 25       | 137                     |
| 53       | 15                          | 124                                         | 139                                         | 3        | 1               | 1                     | 5        | 1             | 7        | 13       | 21       | 7.5                                 | 10.5          | 18       | 121                     |
| 54       | 11                          | 118                                         | 129                                         | 3        | ..              | ..                    | 3        | 1             | 2        | 18       | 21       | 5.5                                 | 10.5          | 16       | 113                     |
| 55       | 5                           | 108                                         | 113                                         | ..       | 2               | 1                     | 3        | 7             | 4        | 14       | 25       | 2.5                                 | 12.5          | 15       | 98                      |
| 56       | 4                           | 88                                          | 92                                          | 1        | ..              | ..                    | 1        | 1             | 4        | 10       | 15       | 2                                   | 7.5           | 9.5      | 82.5                    |
| 57       | ..                          | 77                                          | 77                                          | 1        | ..              | ..                    | 1        | 1             | 4        | 12       | 17       | ..                                  | 8.5           | 8.5      | 68.5                    |
| 58       | 3                           | 60                                          | 63                                          | ..       | 1               | ..                    | 1        | 1             | 2        | 8        | 11       | 1.5                                 | 5.5           | 7        | 56                      |
| 59       | ..                          | 52                                          | 52                                          | ..       | ..              | ..                    | ..       | 1             | 1        | 11       | 13       | ..                                  | 6.5           | 6.5      | 45.5                    |
| 60       | ..                          | ..                                          | 39                                          | 1        | 1               | ..                    | 2        | 2             | ..       | 12       | 14       | ..                                  | 7             | 7        | 32                      |
| 61       | ..                          | ..                                          | 25                                          | ..       | ..              | ..                    | ..       | ..            | ..       | 3        | 3        | ..                                  | 1.5           | 1.5      | 23.5                    |
| 62       | ..                          | ..                                          | 22                                          | 1        | ..              | ..                    | 1        | ..            | ..       | 5        | 5        | ..                                  | 2.5           | 2.5      | 19.5                    |
| 63       | ..                          | ..                                          | 17                                          | ..       | ..              | ..                    | ..       | ..            | 1        | 3        | 4        | ..                                  | 2             | 2        | 15                      |
| 64       | ..                          | ..                                          | 13                                          | ..       | ..              | ..                    | ..       | ..            | ..       | 5        | 5        | ..                                  | 2.5           | 2.5      | 10.5                    |
| 65       | ..                          | ..                                          | 8                                           | ..       | ..              | ..                    | ..       | ..            | 1        | 3        | 4        | ..                                  | 2             | 2        | 6                       |
| 66       | ..                          | ..                                          | 4                                           | ..       | ..              | ..                    | ..       | ..            | ..       | 2        | 2        | ..                                  | 1             | 1        | 3                       |
| 67       | ..                          | ..                                          | 2                                           | ..       | ..              | ..                    | ..       | ..            | ..       | 2        | 2        | ..                                  | 1             | 1        | 1                       |
| 68       | ..                          | ..                                          | ..                                          | ..       | ..              | ..                    | ..       | ..            | ..       | ..       | ..       | ..                                  | ..            | ..       | ..                      |
|          | 1,546                       |                                             | 12,041                                      | 213      | 90              | 5                     | 308      | 270           | 245      | 1,031    | 1,546    | 773.0                               | 773.0         | 1,546.0  | 10,495.0                |



Of the 308 wrecks which have taken place, it will be observed that no less than 213 have been total wrecks, 90 partial wrecks, and 5 losses by fire.

The following Abstract exhibits in a condensed form the results arrived at in this Table.

## ABSTRACT E.

| Ages.     | Number exposed to Risk of Wreck. | Total Number of Wrecks. |                 | Per Centage, Yearly, of, |                 | Total Losses. |              |
|-----------|----------------------------------|-------------------------|-----------------|--------------------------|-----------------|---------------|--------------|
|           |                                  | Total Wrecks.           | Partial Wrecks. | Total Wrecks.            | Partial Wrecks. | Number.       | Per Centage. |
| 19 to 20  | 2.5                              | ..                      | ...             | ...                      | ...             | ...           | ...          |
| 21 ... 25 | 329.0                            | 9                       | 4               | 2.736                    | 1.216           | 13            | 3.951        |
| 26 ... 30 | 1,368.0                          | 23                      | 15              | 1.681                    | 1.096           | 39            | 2.851        |
| 31 ... 35 | 2,083.5                          | 49                      | 16              | 2.352                    | 0.768           | 66            | 3.168        |
| 36 ... 40 | 2,396.5                          | 57                      | 16              | 2.378                    | 0.667           | 73            | 3.046        |
| 41 ... 45 | 2,054.5                          | 35                      | 17              | 1.703                    | 0.827           | 52            | 2.531        |
| 46 ... 50 | 1,266.0                          | 18                      | 14              | 1.422                    | 1.106           | 33            | 2.607        |
| 51 ... 55 | 632.3                            | 18                      | 6               | 2.848                    | 0.949           | 26            | 4.114        |
| 56 ... 60 | 284.5                            | 3                       | 2               | 1.054                    | 0.703           | 5             | 1.757        |
| 61 ... 65 | 74.5                             | 1                       | ...             | 1.342                    | ...             | 1             | 1.342        |
| 66 ... 68 | 4.0                              | ...                     | ...             | ...                      | ...             | ...           | ...          |
| Total...  | 10,495.0                         | 213                     | 90              | 2.029                    | 0.857           | 308           | 2.935        |

It will thus be seen, that at the younger ages, the wrecks and losses of property under the charge of master mariners, is greater than at the more advanced ages, and these facts, viewed in connection with the circumstance already alluded to, that the loss of life from accidental and extraordinary events is also more frequent at younger ages, strengthens the presumption, that increased years and experience among the captains of merchant vessels, give greater security to both life and property under their charge.

Having thus shewn the principal results arrived at, attention will be next directed to the application of them to the monetary affairs of Life Offices. It is very much to be regretted, that the proprietors and managers of Life Assurance Companies should have given so very little attention to the nature of the risks which they are constantly undertaking, and have contributed little or nothing in a pecuniary point of view, to the investigation of those branches of science, by the application of which the shareholders have realized immense and most exorbitant profits, on the capital invested in such speculations. It is notorious, that notwithstanding many societies have at command a greater capital than some of the Governments of Europe, there is not a single public document extant, throwing light on the state and condition of any other class of the community than their own members, published at the expense of those societies. Of the very meagre quantity of information which does exist, all has been derived from other sources; and there is no wonder, therefore, that in these wealthy corporations there should exist the anomalous feature unknown to other matters of enterprise and industry, of the practice being much in advance of the science on which it should be founded; in fact, after the most diligent inquiries, a single instance has not been found of any one of these great and powerful Companies, which boast of their millions of invested capital,



having spent £500 in the original investigation of any single branch or department of vital statistics. It is, therefore, hoped that it will not be considered out of place to bring under attention the details of a question which, under other circumstances, would properly belong to the traders in the shares of Life Assurance Institutions.

In the preceding inquiry, an analysis has been made of the various causes of death. This is, no doubt, important as suggesting means by which, under sanitary regulations, the intensity of some of those forces may be lessened, but, for the general purposes of a Life Office, a knowledge of the gross rate of mortality is all that is required. Attention is therefore now directed to the results given in Abstract A; from which a Table of Decrements may be easily formed. In that Abstract, the rate of mortality is given for quinquennial ages only, but the intermediate terms may be found in the following manner.

Let the figures in the second column of the following Abstract represent the original quantities for quinquennial ages, derived from Abstract A, and let the columns headed  $\Delta_1$ ,  $\Delta_2$ ,  $\Delta_3$ , be the 1st, 2nd, and 3rd differences of the original quantities, also let  $(a)$ ,  $(b)$ , and  $(c)$ , which are the second and every alternate quantity in each of the three last columns, be equal to  $\cdot 2\Delta_1$ ,  $\cdot 04\Delta_2$ , and  $\cdot 008\Delta_3$ , respectively.

## ABSTRACT F.

*Differences for Interpolation of Mortality from all Causes.*

| Age. | Mortality<br>per Cent. | $\Delta_1$<br>$a = \cdot 2 \Delta_1$ | $\Delta_2$<br>$b = \cdot 04 \Delta_2$ | $\Delta_3$<br>$c = \cdot 008 \Delta_3$ |
|------|------------------------|--------------------------------------|---------------------------------------|----------------------------------------|
| 23   | 1.791                  | + .415<br>+ .0830 = $a$              | — .206<br>— .00824 = $b$              | — .165<br>— .001320 = $c$              |
| 28   | 2.206                  | + .209<br>+ .0418                    | — .371<br>— .01484                    | — .648<br>— .005184                    |
| 33   | 2.415                  | — .162<br>— .0324                    | + .277<br>+ .01108                    | + .404<br>+ .003232                    |
| 38   | 2.253                  | + .115<br>+ .0230                    | + .681<br>+ .02724                    | — 1.589<br>— .012712                   |
| 43   | 2.368                  | + .796<br>+ .1592                    | — .908<br>— .03632                    | + 2.195<br>+ .017560                   |
| 48   | 3.164                  | — .112<br>— .0224                    | + 1.287<br>+ .05148                   | — 1.096<br>— .008768                   |
| 53   | 3.052                  | + 1.175<br>+ .2350                   | + .191<br>+ .00764                    | + .521<br>+ .004168                    |
| 58   | 4.227                  | + 1.366<br>+ .2732                   | + .712<br>+ .02848                    |                                        |
| 63   | 5.593                  | + 2.078<br>+ .4156                   |                                       |                                        |
| 68   | 7.671                  |                                      |                                       |                                        |

Then the intervals to be interpolated being  $\frac{1}{5}$ , the intermediate terms to be inserted between the original quantities will be found as follows:—

$$\delta_1 = a - 2b + 6c$$

$$\delta_2 = b - 4c$$

$$\text{and } \delta_3 = c$$

P P

[It will



## MORTALITY OF MASTER MARINERS.

## ABSTRACT G.

*Interpolation of Mortality from all Causes.*

| Age. | Mortality<br>per Cent. | $\delta_1$ | $\delta_2$ | Age. | Mortality<br>per Cent. | $\delta_1$ | $\delta_2$ |
|------|------------------------|------------|------------|------|------------------------|------------|------------|
| 21   | 1.604280               |            |            | 46   | 3.077480               | + .141640  | - .071440  |
| 22   | 1.697800               | + .093520  | - .000320  | 47   | 3.147680               | .070200    | .053880    |
| 23   | <b>1.791</b>           | .093200    | .001640    | 48   | <b>3.164</b>           | + .016320  | - .194288  |
| 24   | 1.822560               | .091560    | .002960    | 49   | 2.986032               | - .177968  | + .086552  |
| 25   | 1.971160               | .088600    | .004280    | 50   | 2.894616               | .091416    | .077784    |
| 26   | 2.055480               | .084320    | .005600    | 51   | 2.880984               | - .013632  | .069016    |
| 27   | 2.134200               | .078720    | - .006920  | 52   | 2.936368               | + .055384  | .060248    |
| 28   | <b>2.206</b>           | .071800    | + .030784  | 53   | <b>3.052</b>           | .115632    | + .129096  |
| 29   | 2.308584               | .102584    | - .035576  | 54   | 3.296728               | .244728    | - .009032  |
| 30   | 2.375592               | .067008    | .030392    | 55   | 3.532424               | .235696    | .004864    |
| 31   | 2.412208               | .036616    | .025208    | 56   | 3.763256               | .230832    | - .000696  |
| 32   | 2.423616               | + .011408  | .020024    | 57   | 3.993392               | .230136    | + .003472  |
| 33   | <b>2.415</b>           | - .008616  | .026552    | 58   | <b>4.227</b>           | .233608    | + .059384  |
| 34   | 2.379832               | .035168    | - .001848  | 59   | 4.519992               | .292992    | - .001128  |
| 35   | 2.342816               | .037016    | + .001384  | 60   | 4.811856               | .291864    | .009896    |
| 36   | 2.307184               | .035632    | .004616    | 61   | 5.093824               | .281968    | .018664    |
| 37   | 2.276168               | .031016    | + .007848  | 62   | 5.357128               | .263304    | - .027432  |
| 38   | <b>2.253</b>           | .023168    | - .084584  | 63   | <b>5.593</b>           | .235872    | + .139440  |
| 39   | 2.145248               | .107752    | + .078088  | 64   | 5.968312               | .375312    | .024312    |
| 40   | 2.115584               | - .029664  | .065376    | 65   | 6.367936               | .399624    | .020144    |
| 41   | 2.151296               | + .035712  | .052664    | 66   | 6.787704               | .419768    | .015976    |
| 42   | 2.239672               | .088376    | .039952    | 67   | 7.223448               | .435744    | + .011808  |
| 43   | <b>2.368</b>           | .128328    | + .208872  | 68   | <b>7.671</b>           | + .447552  |            |
| 44   | 2.705200               | .337200    | - .106560  |      |                        |            |            |
| 45   | 2.935840               | + .230640  | - .089000  |      |                        |            |            |



It will be observed that there is considerable irregularity in the original quantities, as taken from Abstract A; but it was thought better not to disturb the natural results by any attempt to convert them into a graduated series. After the quinquennial period of life 50-55, the numbers are too small to warrant much reliance being placed on the results, and, therefore, subsequent to that period, an increasing series has been adopted, maintaining, as nearly as possible, the same relation at those advanced ages, to the ordinary tables of mortality for male life, as the figures in Abstract A, for younger ages, bear to the general mortality of England and Wales.

From the results thus obtained, the following Table of Decrements is derived.

TABLE V.

*Decrements and Rate of Mortality from all causes.*

| Age. | Mortality<br>per Cent.<br>= $d$ . | $\lambda l$<br>$5 + \Sigma(c) = \lambda l$<br>$\lambda\left(1 - \frac{d}{100}\right) = c$ | Number<br>Living.<br>= $l$ | Number<br>Dying. | Age. | Mortality<br>per Cent.<br>= $d$ . | $\lambda l$<br>$5 + \Sigma(c) = \lambda l$<br>$\lambda\left(1 - \frac{d}{100}\right) = c$ | Number<br>Living.<br>= $l$ | Number<br>Dying. |
|------|-----------------------------------|-------------------------------------------------------------------------------------------|----------------------------|------------------|------|-----------------------------------|-------------------------------------------------------------------------------------------|----------------------------|------------------|
| 21   | 1.604                             | 5.0000000                                                                                 | 100,000                    | 1,604            | 40   | 2.116                             | 4.8198832                                                                                 | 66,052                     | 1,398            |
| 22   | 1.698                             | 9.9929774                                                                                 | 98,396                     | 1,671            | 41   | 2.151                             | 9.9907117                                                                                 | 64,654                     | 1,391            |
| 23   | 1.791                             | 4.9929774                                                                                 | 96,725                     | 1,732            | 42   | 2.240                             | .8105949                                                                                  | 63,263                     | 1,417            |
| 24   | 1.883                             | .9925624                                                                                  | 94,993                     | 1,789            | 43   | 2.368                             | .9905564                                                                                  | 61,846                     | 1,464            |
| 25   | 1.971                             | .9855398                                                                                  | 93,204                     | 1,837            | 44   | 2.705                             | .8011513                                                                                  | 60,382                     | 1,634            |
| 26   | 2.055                             | .9921513                                                                                  | 91,367                     | 1,877            | 45   | 2.936                             | .9901612                                                                                  | 58,748                     | 1,725            |
| 27   | 2.134                             | .9776911                                                                                  | 89,490                     | 1,909            | 46   | 3.077                             | .7913125                                                                                  | 57,023                     | 1,754            |
| 28   | 2.206                             | .9917443                                                                                  | 87,581                     | 1,933            | 47   | 3.148                             | .9895922                                                                                  | 55,269                     | 1,740            |
| 29   | 2.309                             | .9694354                                                                                  | 85,648                     | 2,009            | 48   | 3.164                             | .7809047                                                                                  | 53,529                     | 1,694            |
| 30   | 2.376                             | .9913546                                                                                  | 83,639                     | 1,987            | 49   | 2.986                             | .9880905                                                                                  | 51,835                     | 1,547            |
| 31   | 2.412                             | .9607900                                                                                  | 81,652                     | 1,969            | 50   | 2.894                             | .7689952                                                                                  | 50,288                     | 1,456            |
| 32   | 2.424                             | .9909823                                                                                  | 79,683                     | 1,932            | 51   | 2.881                             | .9870582                                                                                  | 48,832                     | 1,407            |
| 33   | 2.415                             | .9517723                                                                                  | 77,751                     | 1,878            | 52   | 2.936                             | .7560534                                                                                  | 47,425                     | 1,392            |
| 34   | 2.380                             | .9906318                                                                                  | 75,873                     | 1,805            | 53   | 3.052                             | .9864268                                                                                  | 46,033                     | 1,405            |
| 35   | 2.343                             | .9424041                                                                                  | 74,068                     | 1,736            | 54   | 3.297                             | .7424802                                                                                  | 44,628                     | 1,471            |
| 36   | 2.307                             | .9903122                                                                                  | 72,332                     | 1,668            | 55   | 3.532                             | .9861086                                                                                  | 43,157                     | 1,525            |
| 37   | 2.276                             | .9327163                                                                                  | 70,664                     | 1,609            | 56   | 3.763                             | .7285888                                                                                  | 41,632                     | 1,566            |
| 38   | 2.253                             | .9896946                                                                                  | 69,055                     | 1,556            | 57   | 3.993                             | .9860368                                                                                  | 40,066                     | 1,600            |
| 39   | 2.145                             | .9224109                                                                                  | 67,499                     | 1,447            | 58   | 4.227                             | .7146256                                                                                  | 38,466                     | 1,626            |
|      |                                   | .9895566                                                                                  |                            |                  |      |                                   | .9868344                                                                                  |                            |                  |
|      |                                   | .9119675                                                                                  |                            |                  |      |                                   | .7014600                                                                                  |                            |                  |
|      |                                   | .9893964                                                                                  |                            |                  |      |                                   | .9872461                                                                                  |                            |                  |
|      |                                   | .9013639                                                                                  |                            |                  |      |                                   | .6887061                                                                                  |                            |                  |
|      |                                   | .9893430                                                                                  |                            |                  |      |                                   | .9873042                                                                                  |                            |                  |
|      |                                   | .8907069                                                                                  |                            |                  |      |                                   | .6760103                                                                                  |                            |                  |
|      |                                   | .9893831                                                                                  |                            |                  |      |                                   | .9870582                                                                                  |                            |                  |
|      |                                   | .8800900                                                                                  |                            |                  |      |                                   | .6630685                                                                                  |                            |                  |
|      |                                   | .9895388                                                                                  |                            |                  |      |                                   | .9865389                                                                                  |                            |                  |
|      |                                   | .8696288                                                                                  |                            |                  |      |                                   | .6496074                                                                                  |                            |                  |
|      |                                   | .9897034                                                                                  |                            |                  |      |                                   | .9854399                                                                                  |                            |                  |
|      |                                   | .8593322                                                                                  |                            |                  |      |                                   | .6350473                                                                                  |                            |                  |
|      |                                   | .9898634                                                                                  |                            |                  |      |                                   | .9843833                                                                                  |                            |                  |
|      |                                   | .8491956                                                                                  |                            |                  |      |                                   | .6194306                                                                                  |                            |                  |
|      |                                   | .9900012                                                                                  |                            |                  |      |                                   | .9833421                                                                                  |                            |                  |
|      |                                   | .8391968                                                                                  |                            |                  |      |                                   | .6027727                                                                                  |                            |                  |
|      |                                   | .9901034                                                                                  |                            |                  |      |                                   | .9823029                                                                                  |                            |                  |
|      |                                   | 4.8293002                                                                                 |                            |                  |      |                                   | 4.5850756                                                                                 |                            |                  |
|      |                                   | 9.9905830                                                                                 |                            |                  |      |                                   | 9.9812431                                                                                 |                            |                  |



TABLE V.—(continued.)

| Age. | Mortality<br>per Cent.<br>= $d$ . | $\lambda l$<br>$5 + \Sigma(c) = \lambda l$<br>$\lambda(1 - \frac{d}{100}) = c$ | Number<br>Living.<br>= $l$ . | Number<br>Dying. | Age. | Mortality<br>per Cent.<br>= $d$ . | $\lambda l$<br>$5 + \Sigma(c) = \lambda l$<br>$\lambda(1 - \frac{d}{100}) = c$ | Number<br>Living.<br>= $l$ . | Number<br>Dying. |
|------|-----------------------------------|--------------------------------------------------------------------------------|------------------------------|------------------|------|-----------------------------------|--------------------------------------------------------------------------------|------------------------------|------------------|
| 59   | 4.520                             | 4.5863187                                                                      | 36,840                       | 1,665            | 80   | 18.384                            | 3.6738961                                                                      | 4,720                        | 868              |
| 60   | 4.812                             | 9.9799124<br>5.462311                                                          | 35,175                       | 1,693            | 81   | 19.701                            | 9.9117753<br>5.856714                                                          | 3,852                        | 759              |
| 61   | 5.094                             | 9.785822<br>5.248133                                                           | 33,482                       | 1,705            | 82   | 21.083                            | 9.047101<br>4.903815                                                           | 3,093                        | 652              |
| 62   | 5.357                             | 9.772937<br>5.021070                                                           | 31,777                       | 1,703            | 83   | 22.762                            | 8.971706<br>3.875521                                                           | 2,441                        | 556              |
| 63   | 5.593                             | 9.760885<br>4.781955                                                           | 30,074                       | 1,682            | 84   | 24.080                            | 8.878310<br>2.753831                                                           | 1,885                        | 454              |
| 64   | 5.968                             | 9.750042<br>4.531997                                                           | 28,392                       | 1,694            | 85   | 25.672                            | 8.803562<br>1.557393                                                           | 1,431                        | 367              |
| 65   | 6.368                             | 9.732757<br>4.264754                                                           | 26,698                       | 1,700            | 86   | 27.262                            | 8.711524<br>3.0268917                                                          | 1,064                        | 290              |
| 66   | 6.788                             | 9.714243<br>3.978997                                                           | 24,998                       | 1,697            | 87   | 28.862                            | 8.617614<br>2.8886531                                                          | 774                          | 224              |
| 67   | 7.223                             | 9.694718<br>3.673715                                                           | 23,301                       | 1,683            | 88   | 30.567                            | 8.521017<br>7.407548                                                           | 550                          | 168              |
| 68   | 7.671                             | 9.674403<br>3.348118                                                           | 21,618                       | 1,658            | 89   | 32.112                            | 8.415659<br>5.823207                                                           | 382                          | 122              |
| 69   | 8.228                             | 9.653381<br>3.001499                                                           | 19,960                       | 1,643            | 90   | 33.802                            | 8.317930<br>4.141137                                                           | 260                          | 88               |
| 70   | 8.813                             | 9.627102<br>2.628601                                                           | 18,317                       | 1,618            | 91   | 35.282                            | 8.208449<br>2.349586                                                           | 172                          | 61               |
| 71   | 9.487                             | 9.598329<br>2.226930                                                           | 16,699                       | 1,584            | 92   | 36.557                            | 8.110251<br>2.0459837                                                          | 111                          | 40               |
| 72   | 10.203                            | 9.567110<br>1.794040                                                           | 15,115                       | 1,542            | 93   | 37.629                            | 8.023837<br>1.8483674                                                          | 71                           | 27               |
| 73   | 11.026                            | 9.532618<br>1.326658                                                           | 13,573                       | 1,497            | 94   | 38.467                            | 7.949827<br>6.433501                                                           | 44                           | 17               |
| 74   | 11.909                            | 9.492631<br>0.819289                                                           | 12,076                       | 1,438            | 95   | 39.051                            | 7.891081<br>4.324582                                                           | 27                           | 11               |
| 75   | 12.881                            | 9.449315<br>4.0268604                                                          | 10,638                       | 1,370            | 96   | 39.635                            | 7.849666<br>1.2174248                                                          | 16                           | 6                |
| 76   | 13.874                            | 9.401129<br>3.9669733                                                          | 9,268                        | 1,286            | 97   | 40.219                            | 7.807852<br>0.9982100                                                          | 10                           | 4                |
| 77   | 14.957                            | 9.351343<br>9.021076                                                           | 7,982                        | 1,194            | 98   | 40.803                            | 7.765632<br>7.747732                                                           | 6                            | 2                |
| 78   | 16.040                            | 9.296386<br>8.317462                                                           | 6,788                        | 1,089            | 99   | 41.387                            | 7.722991<br>5.470729                                                           | 4                            | 2                |
| 79   | 17.191                            | 9.240724<br>3.7558186                                                          | 5,699                        | 979              | 100  | 41.971                            | 9.7679940<br>0.3150669                                                         | 2                            |                  |
|      |                                   | 9.9180775                                                                      |                              |                  |      |                                   |                                                                                |                              |                  |

From this has been constructed the following preparatory Table for the determination of the values of annuities, assurances, and other risks on the lives of Master Mariners.

Column D of Table VI has been formed for the expression  $l_m v^m$ , in which

$l_m$  represents the numbers living at the age  $m$  in the fourth column of Table V,

And  $v^m$  represents the present value of £1 due  $m$  years hence, at 3 per cent. Also, if

$D_m$  = quantity in column D, at any given age  $m$ , and

$D_{m+x}$  = do. do. at any variable higher age  $m+x$

then, in the same Table, will  $N_m = \Sigma(D_{m+x})$ , in which  $m+x$  receives every integral value from any given age, to the oldest age in the Table.

[From Table



TABLE VI.

*Preparatory to the determination of the Values of Annuities, &c. &c., on the Lives of Master Mariners.  
(Three per Cent.)*

| Age. | $\lambda D$ | D        | N         | Age. | $\lambda D$ | D       | N        |
|------|-------------|----------|-----------|------|-------------|---------|----------|
| 21   | 4.7304183   | 53754.92 | 928568.52 | 61   | 3.7417426   | 5517.50 | 45291.41 |
| 22   | .7105585    | 51352.14 | 877216.38 | 62   | .7061991    | 5083.92 | 40207.49 |
| 23   | .6902836    | 49009.88 | 828206.50 | 63   | .6694503    | 4671.43 | 35536.06 |
| 24   | .6695977    | 46730.20 | 781476.80 | 64   | .6316173    | 4281.71 | 31254.35 |
| 25   | .6485048    | 44514.84 | 736961.46 | 65   | .5920558    | 3908.91 | 27345.44 |
| 26   | .6270222    | 42366.46 | 694595.00 | 66   | .5506429    | 3553.39 | 23792.05 |
| 27   | .6051672    | 40287.21 | 654307.79 | 67   | .5072774    | 3215.71 | 20576.34 |
| 28   | .5829618    | 38279.11 | 616028.68 | 68   | .4618805    | 2896.55 | 17679.79 |
| 29   | .5604368    | 36344.34 | 579684.34 | 69   | .4143814    | 2596.46 | 15083.33 |
| 30   | .5372942    | 34458.32 | 545226.00 | 70   | .3642544    | 2313.42 | 12769.91 |
| 31   | .5140135    | 32659.80 | 512566.22 | 71   | .3112500    | 2047.62 | 10722.29 |
| 32   | .4905727    | 30943.73 | 481622.49 | 72   | .2551238    | 1799.38 | 8922.91  |
| 33   | .4670785    | 29314.23 | 452308.26 | 73   | .1955484    | 1568.73 | 7354.18  |
| 34   | .4436244    | 27773.10 | 424535.16 | 74   | .1319743    | 1355.11 | 5999.07  |
| 35   | .4203259    | 26322.42 | 398212.74 | 75   | 3.0640685   | 1158.96 | 4840.114 |
| 36   | .3971921    | 24956.98 | 373255.76 | 76   | 2.9913442   | 980.267 | 3859.847 |
| 37   | .3742183    | 23671.09 | 349584.67 | 77   | .9136413    | 819.674 | 3040.173 |
| 38   | .3513823    | 22458.58 | 327126.09 | 78   | .8304427    | 676.772 | 2363.401 |
| 39   | .3286484    | 21313.19 | 305812.90 | 79   | .7416778    | 551.668 | 1811.733 |
| 40   | .3063942    | 20248.56 | 285564.34 | 80   | .6469181    | 443.525 | 1368.208 |
| 41   | .2842687    | 19242.82 | 266321.52 | 81   | .5458562    | 351.444 | 1016.764 |
| 42   | .2619879    | 18280.49 | 248041.03 | 82   | .4377291    | 273.986 | 742.778  |
| 43   | .2393118    | 17350.49 | 230690.54 | 83   | .3220624    | 209.924 | 532.854  |
| 44   | .2160668    | 16446.24 | 214244.30 | 84   | .1970562    | 157.419 | 375.435  |
| 45   | .1913201    | 15535.31 | 198708.99 | 85   | 2.0645752   | 116.031 | 259.4037 |
| 46   | .1655411    | 14640.00 | 184068.99 | 86   | 1.9228904   | 83.7318 | 175.6719 |
| 47   | .1391306    | 13776.24 | 170292.75 | 87   | .7718146    | 59.1309 | 116.5410 |
| 48   | .1124020    | 12953.94 | 157338.81 | 88   | .6110790    | 40.8394 | 75.7016  |
| 49   | .0856016    | 12178.72 | 145160.09 | 89   | .4398077    | 27.5301 | 48.1715  |
| 50   | .0595988    | 11470.93 | 133689.16 | 90   | .2587635    | 18.1453 | 30.0262  |
| 51   | .0340076    | 10814.53 | 122874.63 | 91   | 1.0667712   | 11.6620 | 18.3642  |
| 52   | 4.0084746   | 10197.05 | 112677.58 | 92   | 0.8649590   | 7.32755 | 11.03665 |
| 53   | 3.9826956   | 9609.38  | 103067.20 | 93   | .6545055    | 4.51342 | 6.52323  |
| 54   | .9563973    | 9044.76  | 94022.44  | 94   | .4366510    | 2.73307 | 3.79016  |
| 55   | .9289999    | 8491.80  | 85530.64  | 95   | 0.2129219   | 1.63276 | 2.15740  |
| 56   | .9005460    | 7953.27  | 77577.37  | 96   | 9.9850512   | .96616  | 1.19124  |
| 57   | .8710509    | 7431.06  | 70146.31  | 97   | .7529992    | .56624  | .62500   |
| 58   | .8405166    | 6926.54  | 63219.77  | 98   | .5167252    | .32864  | .29636   |
| 59   | .8089224    | 6440.54  | 56779.23  | 99   | .2761877    | .18888  | .10748   |
| 60   | 3.7759976   | 5970.32  | 50808.91  | 100  | 9.0313444   | .10748  | .00000   |

From Table V preceding, and Table C, pp. 5-6 *ante*, the following results have been obtained; shewing for different ages the equation of life for Master Mariners, and also for the male population of England and Wales.

| Ages. | Equation of Life. |                    |                      |
|-------|-------------------|--------------------|----------------------|
|       | Mariners.         | England and Wales. | Difference per Cent. |
| 21    | 29.1              | 44.0               | 51.2                 |
| 30    | 25.0              | 36.5               | 46.0                 |
| 40    | 20.9              | 28.8               | 37.8                 |
| 50    | 15.5              | 21.2               | 36.8                 |
| 60    | 10.5              | 14.3               | 36.2                 |



The foregoing is sufficient to shew the necessity of great caution in undertaking special risks on life, and the need of careful and extensive statistical research, to form a basis for calculations in this branch of life contingencies. Within the last few years, Assurance Institutions have very much increased, and the public journals sufficiently testify to the remarkable efforts made by them to extend their business among all ranks and grades of society. It is, therefore, of the first importance that those entrusted with the management of such companies, should possess accurate statistical information, to guide them in their transactions with the public. The practice of a mere arbitrary imposition of premiums for special risks unfortunately prevails to too great an extent, and is liable to very serious objections. The hazard of charging inadequate terms, may endanger the safety of the institutions, and exorbitant rates limit the practice of life assurance, while the want of clear and satisfactory data, produces distrust among the managers themselves, and deprives their efforts of that confidence and energy, which is necessary to the successful development of every enterprise. It is, therefore, hoped that the preceding facts may not be void of practical value and importance, while to the mere scientific inquirer, their novelty will recommend them to some share of attention.

It has been thought better to submit a complete analysis of one class of facts, than to bring under review a variety of data in a cursory manner: but it may be satisfactory to view, in connection with the preceding data derived from the Master Mariners' Society exclusively, another body of facts originating in other sources, namely, in the other Mariners' Friendly Societies distributed over the kingdom, and constituting a portion of the data described in pp. 17-19 *ante*, and which embraces, generally, an humbler class of sea-faring men, than the Master Mariners.

## ABSTRACT H.

| Ages.      | Number exposed to Risk. | Deaths | Mortality per Cent. | Mortality per Cent. in the Master Mariners' Society. (Abstract A.) |
|------------|-------------------------|--------|---------------------|--------------------------------------------------------------------|
| 20 to 25   | 1,562                   | 39     | 2.4968              | 1.791                                                              |
| 26 ... 30  | 5,060                   | 108    | 2.1343              | 2.206                                                              |
| 31 ... 35  | 6,842                   | 167    | 2.4408              | 2.415                                                              |
| 36 ... 40  | 7,549                   | 184    | 2.4374              | 2.253                                                              |
| 41 ... 45  | 5,783                   | 152    | 2.6283              | 2.368                                                              |
| 46 ... 50  | 3,227                   | 104    | 3.2228              | 3.164                                                              |
| 51 ... 55  | 1,716                   | 62     | 3.6130              | 3.052                                                              |
| 56 ... 60  | 651                     | 12     | 1.8433              | 1.911                                                              |
| 61 ... 65  | 119                     | 2      | 1.6882              | ...                                                                |
| Total..... | 32,509                  | 830    | 2.5531              | 2.423                                                              |

The rate of mortality, it will be seen, differs but slightly in the two classes of results, and calls for no particular commentary. Connected with this last body of facts, there has also been made a return of the amount of sickness or invaliding: but the discussion of that part of the inquiry must be reserved for a subsequent part of these contributions, in which the question of sickness generally will be considered.



## MORTALITY OF THE PROVIDENT CLASSES IN THIS COUNTRY AND ON THE CONTINENT.

---

In the present Contribution it is intended to exhibit the rate of Mortality which prevails among the Wealthy, the Middle, and the Provident Classes of this Country and of the Continent.

It has been shewn in pp. 93-9 *ante*, that until the beginning of this year England and Wales were the only portions of the United Kingdom in which public mortuary registers were kept, and, consequently, in which the rate of mortality of the whole population could be accurately measured. In the other divisions of the kingdom, the rate of mortality is known only inferentially, and not by direct observation, and nowhere do the published portion of the public records, as fully explained in pp. 10-16 *ante*, afford the means by which to determine the duration of life in particular classes of the community. There are, however, other sources from which much information may be derived.

In the year 1843, a report was made, by a committee of actuaries, on the mortality among the persons assured by seventeen of the principal assurance companies of this country, (see Table H, col. 5, pp. 40 1,) and these persons may be fairly considered to belong to the middle and upper classes of society; and at various periods since the year 1824, inquiries have been made into the rate of mortality among the members of friendly societies, including the more industrious and prudential of the working and the labouring portion of the people. One important result derived from these investigations is, that while the mortuary registers shew a certain rate of mortality for the whole population of England and Wales, the evidence furnished by the facts constituting the other body of information clearly proves the mortality of the middle and upper classes to be above, and that of the industrious working classes to be below, the ratio for the country generally. This conclusion forms an important consideration in all sanitary inquiries; and, by an obvious inference, determines in what class or section of the people the excessive rate of mortality prevails. For other reasons, however, it is a subject of the first importance to understand clearly the rate of mortality among the middle and upper classes.

The *Journal of the Statistical Society* contains a valuable body of evidence on this question, which goes to prove that among the peerage, the country gentry, and the professional classes, the rate of mortality is higher than that of the country generally: and, as already pointed out in pp. 42-3, the report by the committee of actuaries shews, that among the lives assured by the public companies of this country, the mortality is also not less than that of the general population.



In support of the results derived from this latter body of facts, there is abundant collateral proof; but it has been thought desirable to test them, if possible, by facts originating in quite an independent source. With this view, an analysis has been made of the experience of some of the life assurance offices in Germany, one of which, the Gotha Society, the largest in the world, had, in the 21 years ending January 1850, assured 22,063 lives. There were, in the beginning of the year 1850, subsisting assurances on no less than 15,471 of these lives; and, on the 1st of January of the present year the number of lives assured was 18,858.

From the following Tables, it will be seen that a very elaborate investigation has been made of the facts presented, and that some of the combinations formed are of a novel character in vital statistics; but a very few observations will suffice to bring the results under criticism, as the various Tables and Abstracts sufficiently explain themselves. It should be stated that the information is collected from the very admirable annual reports of the Gotha Life Office, and that wherever tabulated results were furnished in these documents, their accuracy has been tested by a reconstruction of the figures from the original abstracts.

The following Table exhibits the rate of mortality in this Society for each of the eight years 1842-49, and the difference for each quinquennial term of life between the actual rate of mortality and that expected according to the data on which the rates or scale of premiums in use by the Society are based, named, a rate of mortality assimilating closely to the "Equitable Experience."

TABLE I.

| Age.     | 1842.    |         |           | 1843.    |         |           | 1844.    |         |           | 1845.    |         |           |
|----------|----------|---------|-----------|----------|---------|-----------|----------|---------|-----------|----------|---------|-----------|
|          | Persons. | Deaths. | Expected. | Persons. | Deaths. | Expected. | Persons. | Deaths. | Expected. | Persons. | Deaths. | Expected. |
| 15 to 25 | 114      | ..      | 0.72      | 116      | ..      | 0.72      | 119      | 1       | 0.79      | 116      | ..      | 0.76      |
| 26 .. 30 | 491      | 4       | 4.01      | 498      | 4       | 4.06      | 513      | 3       | 4.29      | 553      | 3       | 4.58      |
| 31 .. 35 | 1,277    | 7       | 12.49     | 1,280    | 11      | 12.48     | 1,335    | 6       | 13.09     | 1,323    | 9       | 13.02     |
| 36 .. 40 | 2,180    | 26      | 24.41     | 2,190    | 19      | 24.54     | 2,180    | 15      | 24.46     | 2,185    | 14      | 24.72     |
| 41 .. 45 | 2,335    | 27      | 28.15     | 2,505    | 26      | 30.04     | 2,620    | 18      | 31.66     | 2,779    | 22      | 33.75     |
| 46 .. 50 | 1,920    | 28      | 29.02     | 2,073    | 32      | 31.03     | 2,246    | 36      | 33.66     | 2,362    | 40      | 35.85     |
| 51 .. 55 | 1,513    | 24      | 29.82     | 1,644    | 33      | 32.11     | 1,753    | 30      | 34.48     | 1,865    | 31      | 36.86     |
| 56 .. 60 | 1,068    | 31      | 26.82     | 1,162    | 32      | 29.25     | 1,251    | 24      | 31.87     | 1,309    | 44      | 33.28     |
| 61 .. 65 | 612      | 26      | 20.00     | 652      | 18      | 21.58     | 713      | 34      | 22.96     | 806      | 28      | 26.36     |
| 66 .. 70 | 301      | 19      | 13.13     | 342      | 21      | 15.05     | 376      | 21      | 16.73     | 406      | 33      | 18.05     |
| 71 .. 85 | 77       | 6       | 5.36      | 104      | 7       | 7.69      | 143      | 12      | 10.82     | 181      | 14      | 13.90     |
| Total..  | 11,888   | 198     | 193.93    | 12,572   | 203     | 208.55    | 13,249   | 200     | 224.81    | 13,885   | 238     | 241.13    |
| Age.     | 1846.    |         |           | 1847.    |         |           | 1848.    |         |           | 1849.    |         |           |
|          | Persons. | Deaths. | Expected. | Persons. | Deaths. | Expected. | Persons. | Deaths. | Expected. | Persons. | Deaths. | Expected. |
| 15 to 25 | 116      | ..      | 0.72      | 129      | 1       | 0.76      | 106      | ..      | 0.62      | 93       | ..      | 0.60      |
| 26 .. 30 | 569      | 4       | 4.71      | 613      | 6       | 4.97      | 557      | 3       | 4.57      | 559      | 2       | 4.67      |
| 31 .. 35 | 1,334    | 11      | 13.08     | 1,381    | 9       | 13.53     | 1,376    | 17      | 13.46     | 1,358    | 16      | 13.25     |
| 36 .. 40 | 2,233    | 27      | 25.09     | 2,248    | 26      | 25.13     | 2,182    | 31      | 24.69     | 2,207    | 22      | 24.87     |
| 41 .. 45 | 2,851    | 24      | 34.53     | 2,922    | 29      | 35.52     | 2,887    | 40      | 35.20     | 2,822    | 32      | 34.34     |
| 46 .. 50 | 2,534    | 27      | 38.30     | 2,726    | 49      | 40.94     | 2,852    | 38      | 43.66     | 2,944    | 31      | 44.82     |
| 51 .. 55 | 2,007    | 29      | 39.55     | 2,131    | 43      | 42.26     | 2,217    | 45      | 44.20     | 2,357    | 34      | 46.75     |
| 56 .. 60 | 1,373    | 29      | 34.99     | 1,522    | 44      | 38.44     | 1,605    | 45      | 40.84     | 1,713    | 64      | 43.42     |
| 61 .. 65 | 883      | 29      | 28.83     | 964      | 38      | 31.82     | 1,053    | 55      | 34.79     | 1,100    | 56      | 36.22     |
| 66 .. 70 | 459      | 30      | 20.47     | 473      | 24      | 21.36     | 523      | 32      | 23.79     | 553      | 46      | 24.95     |
| 71 .. 85 | 205      | 19      | 16.76     | 252      | 24      | 20.80     | 294      | 33      | 24.45     | 341      | 34      | 28.39     |
| Total..  | 14,564   | 229     | 257.03    | 15,361   | 293     | 275.53    | 15,652   | 339     | 290.27    | 16,047   | 337     | 302.28    |



An inspection of the preceding Table will shew, that in four out of the eight years, there has been experienced a greater number of deaths, than expected according to the Tables of the Society, namely, in the years 1842, 1847, 1848, and 1849; and, according to the following Abstract, it will be seen that the excess of deaths for the whole of the eight years has been 43·47, being about 2·180 per cent. on the expected mortality.

## ABSTRACT A.

*Mortality during the Years 1842—1849.*

| Ages.     | Number of Persons Assured. | Actual Deaths. | Sum of Actual Deaths. | Expected Deaths. | Sum of Expected Deaths. |
|-----------|----------------------------|----------------|-----------------------|------------------|-------------------------|
| 15 to 25  | 909                        | 2              | ...                   | 5·7              | ...                     |
| 26 ... 30 | 4,353                      | 29             | 31                    | 35·9             | 41·6                    |
| 31 ... 35 | 10,664                     | 86             | 117                   | 104·4            | 146·0                   |
| 36 ... 40 | 17,605                     | 180            | 297                   | 157·9            | 343·9                   |
| 41 ... 45 | 21,721                     | 218            | 515                   | 263·2            | 607·1                   |
| 46 ... 50 | 19,657                     | 281            | 796                   | 297·3            | 904·4                   |
| 51 ... 55 | 15,487                     | 269            | 1,065                 | 306·0            | 1210·4                  |
| 56 ... 60 | 11,003                     | 313            | 1,378                 | 278·9            | 1489·3                  |
| 61 ... 65 | 6,789                      | 284            | 1,662                 | 222·6            | 1711·9                  |
| 66 ... 70 | 3,433                      | 226            | 1,888                 | 153·5            | 1865·4                  |
| 71 ... 85 | 1,597                      | 149            | 2,037                 | 128·2            | 1993·6                  |
|           | 113,218                    | 2,037          |                       | 1993·6           |                         |

It is worthy of remark, at this point of the inquiry, that, under the age of 55, the actual rate of mortality is uniformly less than the expected rate, averaging about 12 per cent. less than the rate calculated upon; but, on the other hand, the actual mortality above the age of 55 exceeds the expected mortality about 24 per cent. A comparison of the columns headed "persons assured," for each of the nine years represented in Table I, with the figures in the fourth column of Table XV, following, will shew that the number of persons given in Table I, for each year, is the gross number assured, and not the number exposed to the risk of a whole year's mortality; it would, therefore, lead to a false estimate of the mortality, were it to be measured with reference to the numbers in the columns headed "persons assured;" but this has evidently not been done in the determination of the numbers in the columns headed "expected deaths;" they are derived from the correct number exposed to a whole year's risk of mortality.

It will be observed that the excess of 43 deaths over the expected number in Table I and Abstract A preceding, is due chiefly to the years 1848-9; in the former year, the difference being about 49, and in the latter 35 deaths, the united difference being nearly double that of the gross difference for the eight years under review. It is, therefore, obvious that this result depends on some temporary cause, namely, epidemics prevalent in those years, as will be hereafter seen.

If reference be now made to Table II, which gives the history of the 1285 lives assured in the first year of the Society's existence, it will be found that, at the end of the



year 1838, there had been 196 deaths; the policies on the lives of 124 had lapsed; and 965 persons still remained assured; irrespective of all those assuring subsequent to the year 1829. It will be further seen that the actual number of deaths is almost identical with the number expected, according to the data on which the Society's calculations are based: corresponding very closely with the rate of mortality observed among assured lives generally in this country. It will be further seen that, except at the quinquennial term of life, 56-60, at which the numbers assured are very small, and therefore subject to fluctuation, there is no very important difference between the actual and expected rate of mortality.

TABLE II.

| Ages.     | Number of<br>Persons<br>Assured in<br>1829. | Deaths during 1829—1838. |                     |         |                   | Number of<br>Lives upon<br>which Policies<br>have Lapsed. | Number of<br>Policies sub-<br>sisting at the<br>end of 1838. |
|-----------|---------------------------------------------|--------------------------|---------------------|---------|-------------------|-----------------------------------------------------------|--------------------------------------------------------------|
|           |                                             | Expected.                | Sum of<br>Expected. | Actual. | Sum of<br>Actual. |                                                           |                                                              |
| 16 to 25  | 19                                          | 1.3                      | ...                 | 1       | ...               | 4                                                         | 14                                                           |
| 26 .. 30  | 85                                          | 7.1                      | 8.4                 | 5       | 6                 | 19                                                        | 61                                                           |
| 31 ... 35 | 189                                         | 18.7                     | 27.1                | 15      | 21                | 27                                                        | 147                                                          |
| 36 ... 40 | 276                                         | 32.5                     | 59.6                | 27      | 48                | 18                                                        | 231                                                          |
| 41 ... 45 | 254                                         | 34.8                     | 94.4                | 40      | 88                | 20                                                        | 194                                                          |
| 46 ... 50 | 184                                         | 31.9                     | 126.3               | 32      | 120               | 19                                                        | 133                                                          |
| 51 ... 55 | 160                                         | 35.5                     | 161.8               | 33      | 153               | 12                                                        | 115                                                          |
| 56 ... 60 | 97                                          | 26.5                     | 188.3               | 36      | 189               | 5                                                         | 56                                                           |
| 61 ... 65 | 21                                          | 7.7                      | 196.0               | 7       | 196               | ...                                                       | 14                                                           |
|           | 1,285                                       | 196.0                    |                     | 196     |                   | 124                                                       | 965                                                          |

The following Table (III) exhibits the rate of mortality among the members of the Society for the twenty-one years 1829-49; and it will be seen, that while the expected mortality was 3193.83, the actual deaths have been 3144, falling short of the expected mortality by about 50 deaths, or 1.560 cent. lower than the expected mortality. It will also be observed that in this, as in Abstract A, the actual exceeds the expected mortality by 19.3 per cent. above the age of 55, but is less under that age by 12.7 per cent. A comparison of the facts presented in this Table, with those in Table II and Abstract A, shews, in a remarkable degree, the amount of deterioration which takes place in the health of the assured after the expiration of a few years from the date of admission. In Table III, the actual number of deaths falls short of the number expected by the Tables of the Society about 1.560 per cent., but in Abstract A, the actual mortality exceeds the expected by 2.180 per cent. The former body of facts embraces all the members of the Society, not only those originally admitted, but also those recently enrolled; and while it includes the mortality of the older class of members long subsequent to their admission, it also contains the mortality in the early years of admission in the same class, and, at the same time, the mortality of those persons but recently admitted. On the other hand, the latter body of facts (Abstract A), although it contains the mortality of members recently admitted, or those entering the Society subsequent to the year 1841, yet it does not contain the mortality for



the older class of members for any of the years preceding 1842; and although, as already remarked, this excess of mortality may be partly due to the epidemics of 1848-9, still it is obvious that the increased mortality is also to some extent owing to the exclusion of the experience of the first fourteen years of the older class of members. That this must be the case, is further evident, from a consideration of the results in Table II, which must be regarded as intermediate between the two other groups of facts just alluded to, as it is free from the admixture of the recently-admitted members with the older, all having been admitted in the year 1829; and it will be observed, that the actual number of deaths is almost identical with that expected by the Tables of the Society; while also, in respect to Table II, it will be observed that there is much greater uniformity in the actual and expected deaths at the different terms of life than in either Abstract A or Table III, and this result is consistent with the exclusion of the new admissions, chiefly taking place at the younger terms of life, in the two other classes of facts.

TABLE III.

*Mortality during the Years 1829—1849.*

| Ages.     | Number of Persons Assured. | Actual Deaths. | Sum of Actual Deaths. | Expected Deaths. | Sum of Expected Deaths. |
|-----------|----------------------------|----------------|-----------------------|------------------|-------------------------|
| 15 to 25  | 1,931                      | 8              | ...                   | 12.0             | ...                     |
| 26 ... 30 | 9,199                      | 71             | 79                    | 73.8             | 85.8                    |
| 31 ... 35 | 22,490                     | 189            | 268                   | 214.6            | 300.4                   |
| 36 ... 40 | 33,928                     | 304            | 572                   | 373.1            | 673.5                   |
| 41 ... 45 | 37,228                     | 356            | 928                   | 442.0            | 1115.5                  |
| 46 ... 50 | 32,362                     | 440            | 1,368                 | 481.5            | 1597.0                  |
| 51 ... 55 | 25,016                     | 450            | 1,818                 | 485.9            | 2082.9                  |
| 56 ... 60 | 17,618                     | 481            | 2,299                 | 440.3            | 2523.2                  |
| 61 ... 65 | 10,370                     | 412            | 2,711                 | 334.8            | 2858.0                  |
| 66 ... 70 | 4,477                      | 271            | 2,982                 | 198.6            | 3056.6                  |
| 71 ... 85 | 1,734                      | 162            | 3,144                 | 137.3            | 3193.9                  |
|           | 196,353                    | 3,144          |                       | 3193.9           |                         |

In order to determine the relation between the actual rate of mortality prevailing among the members of the Gotha Life Society and that of other classes of lives, it is necessary, in the first place, to ascertain the number of persons exposed to the risk of a whole year's mortality at the different terms of life, and this may be easily done by the following formula, in which

$a$  = the total number of persons entering the Society during the whole 21 years, as given in column 3, Table XV.

$b$  = the total number of persons on whose lives policies have lapsed from other causes than death, during the same period of years, as given in column 5, Table XV.

$c$  = the gross number of persons assured at one time or another during the same 21 years, as set forth in column 2, Table III, for the same terms of life at which members



enter or retire from the Society; and, therefore,

$\frac{a+b}{c} \cdot \frac{100}{2}$  = the quantity to be deducted from column 2, Table III, for the same period of life, in order to determine the gross number exposed to the risk of a whole year's mortality. But this quantity cannot be applied as an average ratio to each term of life, as the admissions and demissions are not uniform over each term or period of life in the Table. Let, therefore, the figures in columns 2 and 7 of Table II represent the correct ratio of persons entering the Society, and also withdrawing from all causes, death excepted; also let

$d$  = the total of the numbers in columns 2 and 7 for any term of life in Table II;

$e$  = the sum of the numbers in the two columns 2 and 7 for any given term of life; and

$n$  = the number of the terms of life at which members enter and withdraw; then

$$\lambda x = \lambda e + \lambda \left( \frac{a+b}{c} \cdot \frac{100}{2} \cdot n \right) - \lambda d. \quad \text{And if}$$

$f$  = the quantity at any particular term of life in Table III; then will

$f \cdot (100 - x)$  = the number forming the second column of the following Table.

TABLE IV.

| Age.      | Number exposed to the risk of Mortality for a whole Year. | Number of Deaths that would have happened according to the Mortality of England and Wales. Males. | Sum of the Deaths. | Actual Deaths in the Society. | Sum of Actual Deaths. |
|-----------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------|-------------------------------|-----------------------|
| 15 to 25  | 1,912                                                     | 15.6                                                                                              | ...                | 8                             | ...                   |
| 26 ... 30 | 8,788                                                     | 87.7                                                                                              | 103.3              | 71                            | 79                    |
| 31 ... 35 | 20,403                                                    | 216.9                                                                                             | 320.2              | 189                           | 268                   |
| 36 ... 40 | 29,642                                                    | 343.0                                                                                             | 663.2              | 304                           | 572                   |
| 41 ... 45 | 32,846                                                    | 433.2                                                                                             | 1096.4             | 366                           | 928                   |
| 46 ... 50 | 29,540                                                    | 460.8                                                                                             | 1557.2             | 440                           | 1,368                 |
| 51 ... 55 | 23,420                                                    | 453.2                                                                                             | 2010.4             | 450                           | 1,818                 |
| 56 ... 60 | 16,846                                                    | 426.0                                                                                             | 2436.4             | 481                           | 2,299                 |
| 61 ... 65 | 10,276                                                    | 357.0                                                                                             | 2793.4             | 412                           | 2,711                 |
| 66 ... 70 | 4,477                                                     | 221.5                                                                                             | 3014.9             | 271                           | 2,982                 |
| 71 ... 84 | 1,734                                                     | 181.8                                                                                             | 3196.7             | 162                           | 3,144                 |
|           | 179,884                                                   | 3196.7                                                                                            |                    | 3,144                         |                       |

Column 3 of the preceding Table shews, that if the rate of mortality in the Society had been the same as among the male population of England and Wales, (Table C, pp. 5-6 *ante*) the total number of deaths would have been 3196.59, while, according to column 5 of Table III, the expected mortality by the Tables of the Society was 3194, and, as in column 5 of the present Table, the actual mortality had been 3144. It is therefore evident that the average rate of mortality for the whole population of this country does not, for the whole term of life under observation in Table IV, differ in any important degree from the rate assumed for the basis of the Society's calculations; and it is further evident from a comparison of the last column of Table III, with columns 4 and 6 of Table IV, that the rate of mortality among the general population of England and Wales



approximates nearer to the actual rate of mortality experienced by the Society for the respective terms of life, than the rate assumed in the construction of the Society's Tables; shewing that Table C, just alluded to, is better graduated for practical purposes, than that in actual use by the Society.

In Table V will be found the rate of mortality according to various series of observations. The results in column 2 are deduced from columns 2 and 5 of Table IV, and, therefore, represent the rate of mortality experienced in the Gotha Life Office. And it will be seen, that throughout the whole of life, the mortality is almost always less than among the peerage or the males of the government annuitants, and not differing widely from the results for the whole male population of England and Wales, and those for the lives of the assurance societies in England, but the mortality is much above that experienced by the members generally of friendly societies in England and Wales. A consideration of the peculiar features and constitution of those humble provident institutions, will fully explain the reasons of this increased longevity among the industrious and provident portion of the working classes of this country. This part of the question has already been treated at length in pp. 17-101 *ante*. Column 4 in the following Table represents the rate of mortality as observed among the male members generally of friendly societies throughout England and Wales; but if reference be made to Appendix A of the

TABLE V.

| Age       | Rate of Mortality per Cent. according to the |                                             |                                                                                |          |                               |                                 |
|-----------|----------------------------------------------|---------------------------------------------|--------------------------------------------------------------------------------|----------|-------------------------------|---------------------------------|
|           | Gotha Life Office.                           | England and Wales. Males. Whole Population. | Friendly Societies. Rural, Town, and City Districts. England and Wales. Males. | Peerage. | Government Annuitants. Males. | Assurance Societies in England. |
| 15 to 15  | ·418                                         | ·815                                        | ·679                                                                           | ·507     | 1·37                          | ·738                            |
| 26 ... 30 | ·808                                         | ·998                                        | ·732                                                                           | ·788     | 1·38                          | ·814                            |
| 31 ... 35 | ·926                                         | 1·063                                       | ·798                                                                           | ·949     | 1·18                          | ·892                            |
| 36 ... 40 | 1·026                                        | 1·157                                       | ·887                                                                           | 1·130    | 1·40                          | ·991                            |
| 41 ... 45 | 1·084                                        | 1·319                                       | 1·038                                                                          | 1·533    | 1·40                          | 1·125                           |
| 46 ... 50 | 1·490                                        | 1·560                                       | 1·281                                                                          | 2·118    | 1·49                          | 1·426                           |
| 51 ... 55 | 1·921                                        | 1·935                                       | 1·696                                                                          | 2·581    | 2·32                          | 1·909                           |
| 56 ... 60 | 2·855                                        | 2·529                                       | 2·244                                                                          | 3·212    | 2·92                          | 2·639                           |
| 61 ... 65 | 4·009                                        | 3·474                                       | 3·030                                                                          | 4·322    | 4·08                          | 3·784                           |
| 66 ... 70 | 6·053                                        | 4·947                                       | 4·614                                                                          | 5·764    | 6·17                          | 5·563                           |
| 71 ... 84 | 9·343                                        | 10·482                                      | 8·584                                                                          | 8·155    | 11·43                         | 11·147                          |

Report of the Select Committee of the House of Lords appointed to consider certain matters connected with Provident Associations, session 1847-8, paper No. 126, some interesting examples will be found of remarkable differences in the rates of mortality and sickness in those societies. In a very able paper by Mr. Farr, in the second edition of "M'Culloch's Statistics of the British Empire," it is stated that there is reason to believe that further inquiries will shew that not only sickness, but mortality, will increase in



friendly societies generally; and the results of a recent investigation among the members of Odd Fellow Societies appear to support this opinion, so far as respects mortality. The facts brought forward in the "Contributions on the Rate of Mortality in the Medical Profession," pp. 112-133 *ante*, will also be found to be strikingly corroborative of the general principle which seems to regulate the mortality of other classes, namely, that the humble but industrious working classes, whose prudential habits lead them to become members of these societies, are subject to a less rate of mortality than any other, and that the higher the class of society over which the observations extend, until the peerage, or highest class of all, is observed, in which there is less of the regular and healthful daily exercise essential to the condition of the industrious workman, the greater the rate of mortality; and for intermediate classes, a varying degree of mortality is observable, following pretty closely the scale of their position in social rank.

From the facts brought forward, it appears that the duration of life in the German States of Europe, among the higher provident classes, who embrace the principles of life assurance, is fully equal to that among the like classes in this country, and the value of life amongst those classes approximates closely to the rate of mortality for the general population of England and Wales; but the humbler provident classes who enrol themselves members of friendly societies in this country, enjoy a prolonged duration of life above all others.

That an idea may be formed of how far the results in Tables I, II, III, IV, and the second column of Table V, may be indicative of the state of health of the populations of the different German States, it may be important to shew the number of persons assured for the middle of the period of the 21 years 1829-49, namely, at the end of the year 1838 in each of those districts.

| District.                                                   | Persons. | In every<br>100,000<br>Inhabitants. | District.                                         | Persons. | In every<br>100,000<br>Inhabitants. |
|-------------------------------------------------------------|----------|-------------------------------------|---------------------------------------------------|----------|-------------------------------------|
| Ducal and Grand Ducal Saxon }<br>Territories .....          | 753      | 118                                 | Brought forward ...                               | 7,466    |                                     |
| Free Cities .....                                           | 188      | 62                                  | Oldenburg .....                                   | 74       | 29                                  |
| Brunswick .....                                             | 123      | 49                                  | Hesse Darmstadt .....                             | 200      | 28                                  |
| Principalities, Lippe and Waldeck                           | 73       | 46                                  | Mecklenburg, Schwerin and }<br>Strelitz .....     | 151      | 27                                  |
| Prussia .....                                               | 4,267    | 41                                  | Hohenzollern-Hechingen and }<br>Sigmaringen ..... | 10       | 16                                  |
| Hesse Cassel .....                                          | 289      | 41                                  | Bavaria .....                                     | 584      | 14                                  |
| Hanover .....                                               | 625      | 37                                  | Baden .....                                       | 168      | 14                                  |
| Principalities, Schwarzburg, An- }<br>halt, and Reuss ..... | 129      | 36                                  | Nassau .....                                      | 41       | 11                                  |
| Württemberg .....                                           | 515      | 32                                  | Danish German Territories .....                   | 33       | 8                                   |
| Kingdom of Saxony .....                                     | 504      | 31                                  | German Switzerland .....                          | 52       | 4                                   |
| Carried forward ...                                         | 7,466    |                                     |                                                   | 8,779    |                                     |

The greatest number of the assurers, nearly 49 per cent. of the whole, are in Prussia;



but the States having the greatest proportion of its population assured, are the Ducal and Grand Ducal Saxon territories; and those having the least proportion assured, are the Danish and Swiss German territories.

With the view to determine whether any and what law prevailed in relation to the period which has elapsed from the date of assuring to the date of death among those persons dying in the years 1839-49, distinguishing the age at the time of being assured, a detailed Abstract has been made of each policy, classifying together those of the same age at the date of assuring, and at the same time setting forth the period elapsing until the day of death, and thence arriving at the average period which elapsed from the date of taking out their policies till the day of death, for those entering the Society at different ages. The following Table shews the results arrived at:—

TABLE VII.

*Period elapsed from the date of Assuring, till Death, of those Dying among the Assured, during the Years 1839-49.*

| Age at which<br>the Assurances<br>were effected. | No. of<br>Deaths. | Duration of Life. |         | Duration of Life<br>to each Person. |         | Age at which<br>the Assurances<br>were effected. | No. of<br>Deaths. | Duration of Life. |         | Duration of Life<br>to each Person. |         |
|--------------------------------------------------|-------------------|-------------------|---------|-------------------------------------|---------|--------------------------------------------------|-------------------|-------------------|---------|-------------------------------------|---------|
|                                                  |                   | Years.            | Months. | Years.                              | Months. |                                                  |                   | Years.            | Months. | Years.                              | Months. |
| 15                                               | 2                 | 12                | 11      | 6                                   | 6       | 42                                               | 74                | 725               | 9       | 9                                   | 10      |
| 16                                               | ...               | ...               | ...     | ...                                 | ...     | 43                                               | 83                | 843               | 9       | 10                                  | 2       |
| 17                                               | 1                 | 5                 | 5       | 5                                   | 5       | 44                                               | 74                | 679               | 8       | 9                                   | 2       |
| 18                                               | ...               | ...               | ...     | ...                                 | ...     | 45                                               | 68                | 639               | 2       | 9                                   | 1       |
| 19                                               | 1                 | 7                 | 8       | 7                                   | 8       | 46                                               | 69                | 681               | 4       | 9                                   | 10      |
| 20                                               | 3                 | 14                | 8       | 4                                   | 11      | 47                                               | 81                | 785               | 9       | 9                                   | 8       |
| 21                                               | 1                 | 7                 | 2       | 7                                   | 2       | 48                                               | 83                | 766               | 8       | 9                                   | 3       |
| 22                                               | 4                 | 43                | 7       | 10                                  | 11      | 49                                               | 87                | 845               | 3       | 9                                   | 9       |
| 23                                               | 5                 | 40                | 0       | 8                                   | 0       | 50                                               | 89                | 864               | 2       | 9                                   | 8       |
| 24                                               | 14                | 95                | 6       | 6                                   | 10      | 51                                               | 73                | 720               | 2       | 9                                   | 10      |
| 25                                               | 20                | 161               | 0       | 8                                   | 1       | 52                                               | 72                | 635               | 6       | 8                                   | 10      |
| 26                                               | 16                | 95                | 2       | 6                                   | 0       | 53                                               | 87                | 852               | 11      | 9                                   | 10      |
| 27                                               | 29                | 266               | 11      | 9                                   | 3       | 54                                               | 72                | 804               | 0       | 11                                  | 2       |
| 28                                               | 48                | 316               | 3       | 6                                   | 7       | 55                                               | 64                | 656               | 9       | 10                                  | 3       |
| 29                                               | 51                | 386               | 3       | 7                                   | 7       | 56                                               | 76                | 708               | 4       | 9                                   | 4       |
| 30                                               | 49                | 420               | 0       | 8                                   | 7       | 57                                               | 49                | 422               | 2       | 8                                   | 7       |
| 31                                               | 52                | 411               | 5       | 7                                   | 11      | 58                                               | 81                | 825               | 3       | 10                                  | 2       |
| 32                                               | 70                | 616               | 11      | 8                                   | 10      | 59                                               | 72                | 574               | 11      | 8                                   | 0       |
| 33                                               | 78                | 567               | 0       | 7                                   | 3       | 60                                               | 28                | 307               | 1       | 11                                  | 0       |
| 34                                               | 62                | 531               | 8       | 8                                   | 7       | 61                                               | 14                | 177               | 0       | 12                                  | 8       |
| 35                                               | 93                | 727               | 1       | 7                                   | 10      | 62                                               | 11                | 99                | 9       | 9                                   | 1       |
| 36                                               | 66                | 533               | 8       | 8                                   | 1       | 63                                               | 8                 | 67                | 0       | 8                                   | 5       |
| 37                                               | 78                | 742               | 1       | 9                                   | 6       | 64                                               | 7                 | 59                | 4       | 8                                   | 6       |
| 38                                               | 75                | 655               | 5       | 8                                   | 9       | 65                                               | 3                 | 29                | 4       | 9                                   | 9       |
| 39                                               | 72                | 552               | 11      | 7                                   | 8       | 66                                               | 2                 | 13                | 3       | 6                                   | 7       |
| 40                                               | 81                | 863               | 6       | 10                                  | 8       | 67                                               | 2                 | 17                | 5       | 8                                   | 8       |
| 41                                               | 71                | 702               | 11      | 9                                   | 11      |                                                  |                   |                   |         |                                     |         |

No very distinct or obvious difference is here observable in the various classes of results; and attention is therefore directed to the following Abstract:—



## MORTALITY OF THE PROVIDENT CLASSES

## ABSTRACT C.

*Period elapsed from the date of Assuring, till Death, of those Dying among the Assured, during the Years 1839-49.*

| Age.     | Number of Deaths. | Duration of Life. |         | Duration of Life to each Person. |         | Duration of Life. |         | Duration of Life to each Person. |         |
|----------|-------------------|-------------------|---------|----------------------------------|---------|-------------------|---------|----------------------------------|---------|
|          |                   | Years.            | Months. | Years.                           | Months. | Years.            | Months. | Years.                           | Months. |
| 15 to 19 | 4                 | 26                | 0       | 6                                | 6       | 26                | 0       | 6                                | 6       |
| 20 .. 24 | 27                | 200               | 11      | 7                                | 5       | 1,246             | 6       | 6                                | 6       |
| 25 .. 29 | 164               | 1,225             | 7       | 7                                | 6       |                   |         |                                  |         |
| 30 .. 34 | 311               | 2,547             | 0       | 8                                | 2       | 5,758             | 2       | 8                                | 4       |
| 35 .. 39 | 384               | 3,211             | 2       | 8                                | 4       |                   |         |                                  |         |
| 40 .. 44 | 383               | 3,815             | 7       | 10                               | 0       | 7,533             | 9       | 9                                | 9       |
| 45 .. 49 | 388               | 3,718             | 2       | 9                                | 7       |                   |         |                                  |         |
| 50 .. 54 | 393               | 3,876             | 9       | 9                                | 11      | 7,064             | 2       | 9                                | 8       |
| 55 .. 59 | 342               | 3,187             | 5       | 9                                | 4       |                   |         |                                  |         |
| 60 .. 64 | 68                | 710               | 2       | 10                               | 5       | 770               | 2       | 10                               | 3       |
| 65 .. 67 | 7                 | 60                | 0       | 8                                | 7       |                   |         |                                  |         |
| Total .. | 2,471             | 22,778            | 9       | 9                                | 3       |                   |         |                                  |         |

In which it will be seen, contrary to what would generally be expected, that the period which elapsed from the date of the policies to the date of death is less at the younger than the older ages; so that, if such a law were found generally to prevail, it would follow that a Life Office should find the deaths taking place among the younger lives more immediate than among the older class of lives. Whether this unexpected and apparently anomalous result may arise from the fact that, at the earlier ages, the deaths take place from acute and rapidly-fatal diseases, while at the advanced periods of life, they happen from chronic and lingering causes, is not clearly borne out by the analysis as far as it has yet proceeded; but that such is very probably the case, will appear from a consideration of the preceding

| Age.     | Per Centage of Members Sick during each Year. | Ratio of Sick Members to every 100 not Sick in every Year. | Mortality per Cent. among those Actually Sick. | Sickness per Annum among those Actually Sick. | Total amount of Sickness to each Death. |
|----------|-----------------------------------------------|------------------------------------------------------------|------------------------------------------------|-----------------------------------------------|-----------------------------------------|
| 11 to 15 | 21.9565                                       | 28.1337                                                    | .9901                                          | 4.1231                                        | 416.4290                                |
| 16 .. 20 | 22.0743                                       | 28.3273                                                    | 2.8571                                         | 3.5887                                        | 125.6032                                |
| 21 .. 25 | 22.0386                                       | 28.2686                                                    | 3.0539                                         | 3.8518                                        | 126.1271                                |
| 26 .. 30 | 21.6997                                       | 27.7134                                                    | 3.3271                                         | 4.1921                                        | 125.9977                                |
| 31 .. 35 | 21.0147                                       | 26.6058                                                    | 3.7592                                         | 4.3585                                        | 115.9411                                |
| 36 .. 40 | 21.5471                                       | 27.4650                                                    | 4.0686                                         | 4.9463                                        | 121.5732                                |
| 41 .. 45 | 22.9858                                       | 29.8463                                                    | 4.5306                                         | 5.9418                                        | 131.1468                                |
| 46 .. 50 | 24.6042                                       | 32.6333                                                    | 5.1657                                         | 6.8556                                        | 132.7123                                |
| 51 .. 55 | 27.6422                                       | 38.2022                                                    | 6.2401                                         | 8.5104                                        | 136.3839                                |
| 56 .. 60 | 30.2424                                       | 43.3535                                                    | 7.2732                                         | 10.9261                                       | 150.2235                                |
| 61 .. 65 | 35.5676                                       | 55.2015                                                    | 8.6163                                         | 15.1975                                       | 176.3808                                |
| 66 .. 70 | 46.8493                                       | 88.1443                                                    | 9.6004                                         | 24.2217                                       | 252.2988                                |
| 71 .. 75 | 58.3750                                       | 140.2400                                                   | 12.1306                                        | 32.6275                                       | 268.9679                                |
| 76 .. 80 | 73.5916                                       | 278.6667                                                   | 11.3636                                        | 36.2367                                       | 318.8876                                |
| 81 .. 85 | 74.4624                                       | 291.5790                                                   | 18.4116                                        | 37.7633                                       | 205.1064                                |
| 86 .. 90 | 79.4872                                       | 387.5000                                                   | 17.2043                                        | 41.0829                                       | 238.7943                                |
| 91 .. 95 | 50.0000                                       | 100.0000                                                   | ..                                             | 39.2450                                       | ..                                      |



figures, derived some time ago from the experience of friendly societies in Scotland, from which very accurate and interesting returns were received and carefully analysed.

It is therefore evident that, from the younger to the more advanced ages, there is, among all classes, a uniformly increasing rate of sickness to each death. At the term of life 31-5, there are 116 weeks' sickness to each death, and the rate goes on increasing to the period 76-80, in which the amount of sickness is 319 weeks to each death.

However, the preceding simply shews the average amount of sickness among all the members of a society to each death taking place among the same members at different ages; and the results are not fairly applicable as illustrative of the principle or law manifested in Abstract C, in which it would appear that the period which has elapsed between the date of effecting policies and the date of death of the persons assured thereunder, is less at the younger than at the older ages. For, to determine whether this law has any connection with the more acute forms of disease peculiar to younger ages, only the resulting sickness ending in death, or among those finally dying, at the given terms of life under consideration, should be measured; but it may be interesting, and also important, to shew the average duration of sickness not ending in death, as well as of that proving fatal.

In the following Abstract will be found the results of 5640 attacks of sickness, resulting in recovery; from which it appears that the average duration of each attack is 8.636 weeks: but it is necessary to observe how very much the duration of sickness depends on the age of the persons affected; under the age of 35, the average duration of each attack is about 4.372 weeks; from that to the age of 50, each attack lasts about 5.131 weeks; in the subsequent period of ten years, the duration of each attack is 11.717 weeks; and beyond that age (60), it will be seen that sickness becomes very protracted.

#### ABSTRACT D.

*Duration, in weeks, of Sickness ending in Recovery.*

| Age.     | Attacks. | Sickness. | Average Duration of each Attack. |
|----------|----------|-----------|----------------------------------|
| 11 to 15 | 12       | 39.428    | 3.286                            |
| 16 .. 20 | 106      | 592.143   | 5.586                            |
| 21 .. 25 | 587      | 2399.714  | 4.088                            |
| 26 .. 30 | 900      | 4363.000  | 4.848                            |
| 31 .. 35 | 955      | 3798.857  | 3.978                            |
| 36 .. 40 | 772      | 3870.571  | 5.014                            |
| 41 .. 45 | 678      | 3598.286  | 5.307                            |
| 46 .. 50 | 433      | 2192.857  | 5.064                            |
| 51 .. 55 | 415      | 4794.428  | 11.553                           |
| 56 .. 60 | 364      | 4333.000  | 11.904                           |
| 61 .. 65 | 246      | 5286.286  | 21.489                           |
| 66 .. 70 | 88       | 4219.143  | 47.945                           |
| 71 .. 75 | 68       | 5713.571  | 84.023                           |
| 76 .. 80 | 14       | 2862.286  | 204.449                          |
| 81 .. 85 | 2        | 642.857   | 321.428                          |
|          | 5,640    | 48706.427 | 8.636                            |



It should be clearly kept in view, that the Abstract just given represents such sickness only as ended in the recovery of the members; but in the following Abstract are given the results of 1012 attacks of sickness among 437 persons, whose deaths took place at the terms of life represented in the Table. The figures given in columns 8, 9, and 10, of this Abstract, differ in a remarkable manner from the results at corresponding ages in Abstract D.

## ABSTRACT E.

*Duration, in weeks, of Sickness ending in Death.*

| Age.     | a.<br>Total<br>Amount of<br>Sickness. | b.<br>Amount of<br>Sickness<br>immediately<br>before Death. | a-b.<br>Amount<br>not ending in<br>Death<br>of those<br>afterwards<br>Dying. | c.<br>Attacks. | d.<br>Persons. | c-d.<br>Attacks<br>not ending<br>in Death<br>of those<br>afterwards<br>Dying. | Average<br>duration of<br>each Attack in<br>Total Sickness of<br>those afterwards<br>Dying | Average<br>duration of<br>Attack<br>immediately<br>before Death. | $\frac{a-b}{c-d}$<br>Average<br>duration of<br>Attacks not<br>ending in Death<br>of those after-<br>wards Dying. |
|----------|---------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------|----------------|----------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| 16 to 20 | 157.428                               | 132.714                                                     | 24.714                                                                       | 11             | 7              | 4                                                                             | 14.312                                                                                     | 18.959                                                           | 6.178                                                                                                            |
| 21 .. 25 | 430.571                               | 282.857                                                     | 714.714                                                                      | 50             | 26             | 24                                                                            | 8.611                                                                                      | 10.879                                                           | 6.230                                                                                                            |
| 26 .. 30 | 1120.000                              | 657.714                                                     | 462.286                                                                      | 85             | 38             | 47                                                                            | 13.176                                                                                     | 17.308                                                           | 9.836                                                                                                            |
| 31 .. 35 | 1215.286                              | 700.714                                                     | 514.572                                                                      | 119            | 48             | 71                                                                            | 10.212                                                                                     | 14.598                                                           | 7.247                                                                                                            |
| 36 .. 40 | 654.143                               | 338.857                                                     | 315.286                                                                      | 100            | 40             | 60                                                                            | 6.541                                                                                      | 8.471                                                            | 5.255                                                                                                            |
| 41 .. 45 | 560.428                               | 229.428                                                     | 331.000                                                                      | 80             | 38             | 42                                                                            | 7.005                                                                                      | 6.037                                                            | 7.880                                                                                                            |
| 46 .. 50 | 1252.857                              | 800.428                                                     | 452.429                                                                      | 86             | 36             | 50                                                                            | 14.568                                                                                     | 22.234                                                           | 9.048                                                                                                            |
| 51 .. 55 | 1839.857                              | 1178.714                                                    | 661.143                                                                      | 122            | 47             | 75                                                                            | 15.081                                                                                     | 25.079                                                           | 8.815                                                                                                            |
| 56 .. 60 | 2838.571                              | 2167.000                                                    | 671.571                                                                      | 127            | 49             | 78                                                                            | 22.351                                                                                     | 44.224                                                           | 8.609                                                                                                            |
| 61 .. 65 | 3816.000                              | 3435.714                                                    | 380.286                                                                      | 104            | 41             | 63                                                                            | 36.692                                                                                     | 83.798                                                           | 6.036                                                                                                            |
| 66 .. 70 | 1715.571                              | 1379.286                                                    | 336.285                                                                      | 47             | 23             | 24                                                                            | 36.502                                                                                     | 59.969                                                           | 14.011                                                                                                           |
| 71 .. 75 | 3154.428                              | 3097.143                                                    | 57.285                                                                       | 48             | 23             | 25                                                                            | 65.717                                                                                     | 134.658                                                          | 2.291                                                                                                            |
| 76 .. 80 | 1726.571                              | 1673.571                                                    | 53.000                                                                       | 15             | 7              | 8                                                                             | 115.105                                                                                    | 239.081                                                          | 6.625                                                                                                            |
| 81 .. 85 | 3384.143                              | 3313.714                                                    | 70.429                                                                       | 17             | 13             | 4                                                                             | 199.067                                                                                    | 254.901                                                          | 17.607                                                                                                           |
| 86 .. 90 | ..                                    | ..                                                          | ..                                                                           | ..             | ..             | ..                                                                            | ..                                                                                         | ..                                                               | ..                                                                                                               |
| 91 .. 95 | 353.000                               | 353.000                                                     | ..                                                                           | 1              | 1              | ..                                                                            | 353.000                                                                                    | 353.000                                                          | ..                                                                                                               |
|          | 24218.854                             | 19740.854                                                   | 4478.000                                                                     | 1012           | 437            | 575                                                                           | 23.932                                                                                     | 45.173                                                           | 7.788                                                                                                            |

It will be seen that column 8 represents the average duration of each attack of sickness, including that ending in death, as well as preceding attacks of sickness. In Abstract D, under the age of 35, it was 4.372 weeks; but in column 8, the average duration is 10.830 weeks; and in the more advanced periods of life, a similar increase in the duration of sickness is observable; so that it would seem to follow that the duration of sickness is greater among those dying at periods not very remote from the attacks, than among those surviving; and, consequently, if the duration simply of sickness be closely observed, it offers an element of considerable importance in measuring the expectation or future lifetime of individuals. In Abstract D, the average duration of each attack of sickness for all ages is 8.636 weeks; but in Abstract E, the average duration is 23.932 weeks. The former class of facts relates to persons who all survived the period of twelve years over which the observations extended; but the latter class belongs to persons all of whom died within the same period of twelve years. The force of this conclusion will be more strongly felt, if attention be directed to the figures in column 9, which represent the average duration of the attack of sickness ending in death, at which it will be seen that at every term of life the fatal attack of sickness is of much greater duration than



those represented in column 8, or in Abstract D. The following condensed Abstract will assist in giving a general view of those results.

| Age.           | Average Duration of each Attack of Sickness. |                                                                                |                                                     |                                                                                                          |
|----------------|----------------------------------------------|--------------------------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|                | Ending in Final Recovery.<br>Abstract D.     | Not ending in Death, but among those afterwards Dying.<br>Col. 10, Abstract E. | Immediately preceding Death.<br>Col. 9, Abstract E. | Among those Dying, including the Attacks immediately preceding Death, and others.<br>Col. 8, Abstract E. |
| 11 to 35       | 4.372                                        | 7.872                                                                          | 14.907                                              | 11.031                                                                                                   |
| 36 ... 50      | 5.131                                        | 7.228                                                                          | 12.006                                              | 9.276                                                                                                    |
| 51 ... 60      | 11.717                                       | 8.711                                                                          | 34.851                                              | 18.789                                                                                                   |
| 60 and upwards | 44.794                                       | 7.236                                                                          | 122.708                                             | 60.990                                                                                                   |
| Total.....     | 8.636                                        | 7.788                                                                          | 45.173                                              | 23.932                                                                                                   |

It is hence obvious, that having regard to the ages of persons, the duration of any attack of sickness is a most important consideration in calculating the chances of recovery. If another element, the frequency of a series of attacks of sickness, were introduced (but the details it would here be out of place to discuss), the value or the duration of life of invalids may be calculated with even more precision than the expectation of life of the general community; and if the analysis were carried one step further, and the same classification adopted as in the preceding Abstracts, only keeping the sickness peculiar to each disease by itself, a series of results would be arrived at, furnishing elements of the greatest value in the estimation of the value of life among persons who have suffered or are suffering from disease. Notwithstanding the immense pecuniary interests at stake by life offices, no inquiry or investigation of this kind has ever been undertaken by them, and the preceding and other similar collections of facts, are, it is believed, the only sources of information so analysed which anywhere exist. From the specimens now furnished from the records of friendly societies, the very remarkable aids which they must afford in estimating the value of peculiar classes of lives, by confining fluctuations within known limits, must be evident. The trouble and expense of collecting such data is very great, but still the information itself is of tenfold value to the life institutions of the country.

In the following Abstract will be found the combined results of Abstracts D and E, preceding; and in this, as in all the others, will be found evidence of the same general principle or law of nature which has led to this investigation of the duration of sickness peculiar to different terms of life, namely, that the duration of sickness either in the attacks immediately preceding death, or otherwise, is less protracted at the younger and middle periods of life, than at the more advanced; and hence the solution of the otherwise anomalous facts arrived at in Abstract C, that of the deaths which have taken place among the lives assured at the earlier ages, the time elapsed from the date of the policies to that of death is less than among those assured at the more advanced ages.



## ABSTRACT F.

*Average Duration, in weeks, of Total Sickness.*

| Age.     | Total Number of Attacks, including those ending in Recovery and those ending in Death. | Total Amount of Sickness, including that ending in Recovery and that ending in Death. | Average Duration of each Attack of Sickness, including that ending in Recovery, and that ending in Death. | Number of Attacks, including those ending in Recovery, and those not ending in Death of those afterwards Dying. | Amount of Sickness, including that ending in Recovery, and that not ending in Death of those afterwards Dying. | Average Duration of each Attack of Sickness, including that ending in Recovery, and that not ending in Death of those afterwards Dying. |
|----------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 11 to 15 | 12                                                                                     | 39.428                                                                                | 3.286                                                                                                     | 12                                                                                                              | 39.428                                                                                                         | 3.286                                                                                                                                   |
| 16 .. 20 | 117                                                                                    | 749.571                                                                               | 6.407                                                                                                     | 110                                                                                                             | 616.857                                                                                                        | 5.608                                                                                                                                   |
| 21 .. 25 | 637                                                                                    | 2830.285                                                                              | 4.443                                                                                                     | 611                                                                                                             | 2547.428                                                                                                       | 4.169                                                                                                                                   |
| 26 .. 30 | 985                                                                                    | 5483.000                                                                              | 5.566                                                                                                     | 947                                                                                                             | 4825.286                                                                                                       | 5.095                                                                                                                                   |
| 31 .. 35 | 1,074                                                                                  | 5014.143                                                                              | 4.668                                                                                                     | 1,026                                                                                                           | 4313.429                                                                                                       | 4.204                                                                                                                                   |
| 36 .. 40 | 872                                                                                    | 4524.714                                                                              | 5.188                                                                                                     | 832                                                                                                             | 4185.857                                                                                                       | 5.031                                                                                                                                   |
| 41 .. 45 | 758                                                                                    | 4158.714                                                                              | 5.486                                                                                                     | 720                                                                                                             | 3929.286                                                                                                       | 5.457                                                                                                                                   |
| 46 .. 50 | 519                                                                                    | 3445.714                                                                              | 6.639                                                                                                     | 483                                                                                                             | 2645.286                                                                                                       | 5.477                                                                                                                                   |
| 51 .. 55 | 537                                                                                    | 6634.285                                                                              | 12.354                                                                                                    | 490                                                                                                             | 5455.571                                                                                                       | 11.133                                                                                                                                  |
| 56 .. 60 | 491                                                                                    | 7171.571                                                                              | 14.606                                                                                                    | 442                                                                                                             | 5004.571                                                                                                       | 11.322                                                                                                                                  |
| 61 .. 65 | 350                                                                                    | 9102.286                                                                              | 26.004                                                                                                    | 309                                                                                                             | 5666.572                                                                                                       | 18.338                                                                                                                                  |
| 66 .. 70 | 135                                                                                    | 5934.714                                                                              | 43.930                                                                                                    | 112                                                                                                             | 4555.428                                                                                                       | 40.673                                                                                                                                  |
| 71 .. 75 | 116                                                                                    | 8867.999                                                                              | 76.448                                                                                                    | 93                                                                                                              | 5770.856                                                                                                       | 62.052                                                                                                                                  |
| 76 .. 80 | 29                                                                                     | 4588.857                                                                              | 158.236                                                                                                   | 22                                                                                                              | 2915.286                                                                                                       | 132.513                                                                                                                                 |
| 81 .. 85 | 19                                                                                     | 4027.000                                                                              | 211.947                                                                                                   | 6                                                                                                               | 713.286                                                                                                        | 118.881                                                                                                                                 |
| 86 .. 90 | ..                                                                                     | ..                                                                                    | ..                                                                                                        | ..                                                                                                              | ..                                                                                                             | ..                                                                                                                                      |
| 91 .. 95 | 1                                                                                      | 353.000                                                                               | 353.000                                                                                                   | ..                                                                                                              | ..                                                                                                             | ..                                                                                                                                      |
|          | 6,652                                                                                  | 72925.281                                                                             | 10.959                                                                                                    | 6,215                                                                                                           | 53184.427                                                                                                      | 8.557                                                                                                                                   |

Attention is next directed to the following Table, which is somewhat analogous in its character to Abstract C, only that the element of age, with the view to its more simple application to practical purposes, is excluded. From the register of deaths for the years 1840-9, an abstract has been made of those which have taken place in the first, second, third, and every subsequent year from the date of the policies; and the results constitute the following Table:—



TABLE VIII.

| Year.                     | Deaths among the Assured after the lapse of the following Number of Years from the Date of Assurance. |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |        |
|---------------------------|-------------------------------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|
|                           | 1.                                                                                                    | 2.  | 3.  | 4.  | 5.  | 6.  | 7.  | 8.  | 9.  | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | 20. | 21. | Total. |
| 1840.....                 | 11                                                                                                    | 14  | 14  | 9   | 17  | 9   | 13  | 15  | 17  | 8   | 5   | 13  | ..  | ..  | ..  | ..  | ..  | ..  | ..  | ..  | ..  | 143    |
| 1841.....                 | 14                                                                                                    | 9   | 11  | 10  | 10  | 11  | 14  | 14  | 23  | 15  | 7   | 8   | 18  | ..  | ..  | ..  | ..  | ..  | ..  | ..  | ..  | 164    |
| 1842.....                 | 6                                                                                                     | 8   | 13  | 17  | 14  | 17  | 15  | 20  | 14  | 14  | 24  | 10  | 5   | 21  | ..  | ..  | ..  | ..  | ..  | ..  | ..  | 198    |
| 1843.....                 | 9                                                                                                     | 13  | 5   | 19  | 16  | 10  | 14  | 7   | 14  | 16  | 15  | 20  | 13  | 8   | 24  | ..  | ..  | ..  | ..  | ..  | ..  | 203    |
| 1844.....                 | 4                                                                                                     | 11  | 10  | 9   | 9   | 8   | 14  | 15  | 13  | 7   | 19  | 19  | 26  | 10  | 8   | 18  | ..  | ..  | ..  | ..  | ..  | 200    |
| 1840 to }<br>1844.. }     | 44                                                                                                    | 53  | 53  | 64  | 66  | 55  | 70  | 71  | 81  | 60  | 70  | 70  | 62  | 39  | 32  | 18  | ..  | ..  | ..  | ..  | ..  | 908    |
| 1845.....                 | 11                                                                                                    | 13  | 9   | 8   | 5   | 17  | 12  | 21  | 10  | 11  | 8   | 20  | 25  | 16  | 16  | 12  | 24  | ..  | ..  | ..  | ..  | 238    |
| 1846.....                 | 7                                                                                                     | 13  | 3   | 8   | 20  | 10  | 11  | 15  | 21  | 9   | 14  | 9   | 14  | 18  | 16  | 9   | 8   | 24  | ..  | ..  | ..  | 229    |
| 1847.....                 | 14                                                                                                    | 14  | 15  | 16  | 8   | 12  | 12  | 18  | 12  | 15  | 19  | 18  | 18  | 20  | 25  | 19  | 6   | 7   | 25  | ..  | ..  | 293    |
| 1848.....                 | 7                                                                                                     | 14  | 12  | 14  | 17  | 17  | 16  | 15  | 18  | 14  | 23  | 21  | 21  | 11  | 16  | 23  | 27  | 17  | 7   | 29  | ..  | 339    |
| 1849.....                 | 4                                                                                                     | 13  | 14  | 14  | 8   | 19  | 14  | 13  | 15  | 17  | 13  | 17  | 16  | 22  | 15  | 24  | 17  | 22  | 8   | 14  | 38  | 337    |
| Total..                   | 87                                                                                                    | 120 | 106 | 124 | 124 | 130 | 135 | 153 | 157 | 126 | 147 | 155 | 156 | 126 | 120 | 105 | 82  | 70  | 40  | 43  | 38  | 2,344  |
| Order of }<br>Mortality } | 6                                                                                                     | 9   | 8   | 10  | 10  | 12  | 13  | 15  | 18  | 11  | 14  | 16  | 17  | 11  | 9   | 7   | 5   | 4   | 2   | 3   | 1   |        |

On referring to Abstract C, it will be found that the average period which had elapsed from the date of the policies to the day of death, was nine years and three months; and in the preceding Table it will be also seen, that the greatest number of deaths took place in the ninth year after the date of the policies, the oldest policy being then about twenty-one years. During the five years 1840-4, it is curious to observe, that the greatest number of deaths was also among policies of nine years' standing, although the oldest policy was then of sixteen years' duration only; and it is still further to be observed, that during the five years 1840-4, about one-half of all the deaths took place in the first eight years of the policies; but for the ten years 1840-9, one-half of all the deaths happened in the first nine years, the oldest policies being, in the latter case, of five years' greater duration. At the same time it will be seen that the number of deaths per annum has gone on increasing from 143, in 1840, to 337 in 1849—in the former year, the number of persons assured being 10,234, and in the latter, 15,036; so that, although the number of persons assured increased about 48 per cent., the deaths increased to the extent of 136 per cent. The numerals at the top of the Table shew the duration of the policies, and those in the bottom line of the Table shew the order in which the deaths took place, from the minimum, in the twenty-first year, to the maximum, in the ninth year. It is obvious that the solution of the results here presented will be derived from the law of mortality exhibited in Table IV, the number of persons assured in each year, and the ages of those persons; and that any fluctuation whatever taking place in any one of these elements, must disturb the results set forth in Table VIII. This is observable in Abstract C, the age of the persons assured shewing an important influence on the duration of the policies.

There are also other important practical considerations, as well as those of a more



strictly philosophical and scientific nature, connected with the period of the year at which the deaths took place, and it may therefore be interesting to shew how far the seasons affect the number of deaths in the aggregate, as well as at the different ages or terms of life. In the following Table will be found an analysis of all the deaths which took place in the eleven years 1839-49, distinguishing the months of the year in which they happened, and also the ages at death:—

TABLE IX.

*Ages at which the Deaths among the Assured took place in different Months, during the Years 1839—49.*

| Age.      | MONTHS. |      |        |        |      |       |       |      |       |      |      |      | Total. |
|-----------|---------|------|--------|--------|------|-------|-------|------|-------|------|------|------|--------|
|           | Jan.    | Feb. | March. | April. | May. | June. | July. | Aug. | Sept. | Oct. | Nov. | Dec. |        |
| 16        | ...     | ...  | ...    | 1      | ...  | ...   | ...   | ...  | ...   | ...  | ...  | ...  | 1      |
| 22 to 24  | ...     | ...  | 1      | ...    | 1    | ...   | 1     | ...  | ...   | ...  | ...  | ...  | 3      |
| 25 ... 29 | 2       | 3    | 2      | 2      | 1    | ...   | 5     | 2    | 6     | 4    | 5    | 5    | 37     |
| 30 ... 34 | 8       | 12   | 15     | 10     | 11   | 5     | 6     | 10   | 8     | 9    | 9    | 10   | 113    |
| 35 ... 39 | 16      | 18   | 19     | 10     | 15   | 19    | 20    | 19   | 20    | 23   | 14   | 24   | 217    |
| 40 ... 44 | 22      | 20   | 31     | 26     | 33   | 16    | 22    | 15   | 21    | 24   | 20   | 28   | 278    |
| 45 ... 49 | 26      | 21   | 34     | 28     | 33   | 26    | 27    | 19   | 27    | 19   | 29   | 24   | 313    |
| 50 ... 54 | 25      | 21   | 33     | 33     | 22   | 26    | 23    | 31   | 31    | 26   | 30   | 33   | 334    |
| 55 ... 59 | 31      | 32   | 30     | 36     | 30   | 29    | 22    | 29   | 29    | 21   | 41   | 33   | 363    |
| 60 ... 64 | 25      | 23   | 41     | 28     | 34   | 19    | 35    | 23   | 31    | 34   | 36   | 26   | 355    |
| 65 ... 69 | 21      | 28   | 29     | 28     | 21   | 26    | 18    | 14   | 22    | 19   | 26   | 19   | 271    |
| 70 ... 74 | 11      | 12   | 12     | 7      | 16   | 10    | 13    | 9    | 9     | 14   | 10   | 16   | 139    |
| 75 ... 79 | 5       | 3    | 3      | 5      | 4    | 2     | 2     | 2    | 3     | 3    | 6    | 4    | 42     |
| 80 ... 84 | 1       | 2    | 1      | ...    | ...  | ...   | ...   | ...  | ...   | ...  | ...  | 1    | 5      |
| Total...  | 193     | 195  | 251    | 214    | 221  | 178   | 194   | 173  | 207   | 196  | 226  | 223  | 2,471  |

It thus appears that the greatest number of deaths took place in the month of March, and the least in the month of August; the three months of least mortality being August, June, and January; the three months next in order being July, February, and October; then September, April, and May; and the three months of highest mortality are December, November, and March. If, however, the year were divided into quarters of consecutive months, it will be found that they stand in the following order:—

| Quarter in which the Mortality is of |                   |                  |                    |
|--------------------------------------|-------------------|------------------|--------------------|
| Lowest Intensity.                    | Second Intensity. | Third Intensity. | Highest Intensity. |
| June                                 | December          | September        | March              |
| July                                 | January           | October          | April              |
| August                               | February          | November         | May                |

The months of March, April, and May, it will be seen, constitute the quarter of highest mortality; and out of the following five classes of facts, it will be found that, in three instances, they constitute the quarter of highest mortality, and the month of March enters into the highest quarter of four out of the five groups of facts.



TABLE X.

| SWEDEN.—Years 1831-5. |        |             | GOTHA LIFE OFFICE.—Years 1829-49. |        |
|-----------------------|--------|-------------|-----------------------------------|--------|
| Months.               | Males. | Both Sexes. | Months.                           | Males. |
| July . . . . .        | 11,608 | 22,416      | August . . . . .                  | 173    |
| October . . . . .     | 11,988 | 23,391      | June . . . . .                    | 178    |
| November . . . . .    | 12,848 | 25,579      | January . . . . .                 | 193    |
| June . . . . .        | 13,474 | 25,955      | July . . . . .                    | 194    |
| December . . . . .    | 14,390 | 28,134      | February . . . . .                | 195    |
| August . . . . .      | 14,467 | 28,391      | October . . . . .                 | 196    |
| February . . . . .    | 14,480 | 28,731      | September . . . . .               | 207    |
| September . . . . .   | 14,569 | 28,404      | April . . . . .                   | 214    |
| January . . . . .     | 15,867 | 31,231      | May . . . . .                     | 221    |
| May . . . . .         | 16,220 | 32,130      | December . . . . .                | 223    |
| March . . . . .       | 16,317 | 32,299      | November . . . . .                | 226    |
| April . . . . .       | 16,476 | 32,666      | March . . . . .                   | 251    |

| SAXONY.—Years 1832-8. |        | BELGIUM, TOWNS.—Years 1815-26. |             | GLASGOW.—Years 1836-42. |             |
|-----------------------|--------|--------------------------------|-------------|-------------------------|-------------|
| Months.               | Males. | Months.                        | Both Sexes. | Months.                 | Both Sexes. |
| October . . . . .     | 1,893  | July . . . . .                 | 0·87        | June . . . . .          | 4,258       |
| July . . . . .        | 1,920  | June . . . . .                 | 0·90        | October . . . . .       | 4,339       |
| November . . . . .    | 1,921  | August . . . . .               | 0·91        | September . . . . .     | 4,409       |
| September . . . . .   | 1,927  | May . . . . .                  | 0·95        | July . . . . .          | 4,457       |
| June . . . . .        | 1,932  | September . . . . .            | 0·97        | May . . . . .           | 4,542       |
| December . . . . .    | 1,986  | April . . . . .                | 1·00        | November . . . . .      | 4,597       |
| August . . . . .      | 2,007  | October . . . . .              | 1·00        | April . . . . .         | 4,720       |
| January . . . . .     | 2,220  | November . . . . .             | 1·02        | August . . . . .        | 4,873       |
| February . . . . .    | 2,231  | March . . . . .                | 1·05        | December . . . . .      | 5,267       |
| May . . . . .         | 2,331  | December . . . . .             | 1·08        | February . . . . .      | 5,517       |
| March . . . . .       | 2,387  | February . . . . .             | 1·09        | March . . . . .         | 5,523       |
| April . . . . .       | 2,424  | January . . . . .              | 1·16        | January . . . . .       | 7,090       |

But in respect to the quarter of least mortality, the results are more variable. July enters into four of the five groups, June into two, and August into only one. These remarks have reference to the aggregate mortality only, but if reference be now made to Table IX, it will be seen that the seasons have a very material influence on the mortality of different ages. The following Abstract exhibits the results for different terms of life.

ABSTRACT G.

| Ages.                  | MONTHS. |      |        |        |      |       |       |         |       |          |      |      | Total. |
|------------------------|---------|------|--------|--------|------|-------|-------|---------|-------|----------|------|------|--------|
|                        | Jan.    | Feb. | March. | April. | May. | June. | July. | August. | Sept. | October. | Nov. | Dec. |        |
| Under 40 . . . . .     | 26      | 33   | 37     | 23     | 28   | 24    | 32    | 31      | 34    | 36       | 28   | 39   | 371    |
| 40—59 . . . . .        | 104     | 94   | 128    | 123    | 118  | 97    | 94    | 94      | 108   | 90       | 120  | 118  | 1,288  |
| 60 & upwards . . . . . | 63      | 68   | 86     | 68     | 75   | 57    | 68    | 48      | 65    | 70       | 78   | 66   | 812    |
| Total.....             | 193     | 195  | 251    | 214    | 221  | 178   | 194   | 173     | 207   | 196      | 226  | 223  | 2,471  |



It thus appears that under the age of 40, the least mortality has been in the month of April, and the greatest in the month of December; but in the term of life 40-59, the least mortality has been in the month of October, and the highest in the month of March. Again, in respect to the most advanced term of life, those aged 60 and upwards, the least mortality has, as in the case for the aggregate of all ages, been in the month of August, and the highest likewise in the month of March. The following, then, will represent the quarters of highest and lowest mortality:—

|                                   | Ages at which the Deaths happened. |                               |                               |                               |
|-----------------------------------|------------------------------------|-------------------------------|-------------------------------|-------------------------------|
|                                   | Under Age 40.                      | Ages 40—59.                   | Aged 60 and upwards.          | Results for all Ages.         |
| Quarter of Least Mortality ... }  | April, May, June.                  | June, July, August.           | June, July, August.           | June, July, August.           |
| Quarter Second in Intensity }     | July, August, September.           | December, January, February.  | December, January, February.  | December, January, February.  |
| Quarter Third in Intensity .... } | January, February, March.          | September, October, November. | September, October, November. | September, October, November. |
| Quarter of Highest Mortality }    | October, November, December.       | March, April, May.            | March, April, May.            | March, April, May.            |

Hence, by dividing the year into quarters formed of consecutive months, representing the highest and lowest mortality, it will be seen that the combinations agree for all the terms of life except those for ages under 40: and this is in conformity with the results already observed under Abstracts C, D, E, and F; the more acute form of diseases peculiar to those ages being differently affected by changes of temperature and seasons; but if, instead of the combinations into quarters, the mortality be arranged in the order of the months, a much greater disparity in the results will be observable:—

|    | Order of the Months of Lowest and Highest Mortality, for those Dying aged |           |                 |           |
|----|---------------------------------------------------------------------------|-----------|-----------------|-----------|
|    | Under 40.                                                                 | 40—59.    | 60 and upwards. | All Ages. |
| 1  | April                                                                     | October   | August          | August    |
| 2  | June                                                                      | February  | June            | June      |
| 3  | January                                                                   | July      | January         | January   |
| 4  | May                                                                       | August    | September       | July      |
| 5  | November                                                                  | June      | December        | February  |
| 6  | August                                                                    | January   | February        | October   |
| 7  | July                                                                      | September | April           | September |
| 8  | February                                                                  | May       | July            | April     |
| 9  | September                                                                 | December  | October         | May       |
| 10 | October                                                                   | November  | May             | December  |
| 11 | March                                                                     | April     | November        | November  |
| 12 | December                                                                  | March     | March           | March     |

The influence of the seasons on the mortality at different ages is hence obvious, and there can be little doubt that a more extended series of observations would lead to a well defined law in this respect. The importance of the question to life institutions and to



science, it is hoped, will induce those interested in such objects to investigate the matter further.

The next part of this inquiry to be brought under consideration is that which relates to the disease, or cause of death. The Report of the Gotha Society for the year 1838 contains an abstract of the causes of death for the ten years 1829-38, arranging the diseases according to a general and popular form of classification; and the Report for the year 1848 contains a similar abstract for the twenty years 1829-48. The following shews the results arrived at:—

## ABSTRACT H.

| DISEASE.                                | Number of Deaths during the Years |           |           |           |           |        |               |           |           |           |           |           |        |
|-----------------------------------------|-----------------------------------|-----------|-----------|-----------|-----------|--------|---------------|-----------|-----------|-----------|-----------|-----------|--------|
|                                         | 1829 to 1838.                     |           |           |           |           |        | 1829 to 1848. |           |           |           |           |           |        |
|                                         | At Ages                           |           |           |           |           | Total. | At Ages.      |           |           |           |           |           | Total. |
|                                         | 21 to 30.                         | 31 to 40. | 41 to 50. | 51 to 60. | 61 to 72. |        | 17 to 30.     | 31 to 40. | 41 to 50. | 51 to 60. | 61 to 70. | 71 to 83. |        |
| Fever . . . . .                         | 7                                 | 21        | 38        | 50        | 9         | 125    | 17            | 101       | 143       | 144       | 71        | 15        | 491    |
| Influenza . . . . .                     | ..                                | 9         | 10        | 3         | 7         | 29     | ..            | 11        | 12        | 9         | 12        | 5         | 49     |
| Asiatic Cholera . . . . .               | ..                                | 2         | 5         | 5         | ..        | 12     | ..            | 4         | 12        | 8         | 5         | ..        | 29     |
| Exanthemic Diseases . . . . .           | 1                                 | 2         | ..        | 1         | ..        | 4      | 2             | 5         | ..        | 1         | 1         | ..        | 9      |
| Local Inflammation . . . . .            | 2                                 | 20        | 19        | 29        | 15        | 85     | 12            | 72        | 106       | 103       | 75        | 16        | 384    |
| Gout and Rheumatism . . . . .           | 3                                 | 3         | 7         | 9         | 3         | 25     | 4             | 13        | 25        | 22        | 23        | 2         | 89     |
| Chronic Pulmonary Diseases . . . . .    | 8                                 | 38        | 33        | 22        | 7         | 108    | 19            | 115       | 166       | 111       | 46        | 1         | 458    |
| Chronic Abdominal Diseases . . . . .    | ..                                | 14        | 14        | 10        | 7         | 45     | ..            | 37        | 65        | 86        | 74        | 12        | 274    |
| Mental Affections . . . . .             | ..                                | 3         | 1         | 1         | 2         | 7      | ..            | 9         | 11        | 18        | 9         | 2         | 49     |
| Diseases of Spinal Marrow . . . . .     | ..                                | 3         | 3         | 2         | 2         | 10     | ..            | 5         | 9         | 7         | 10        | 2         | 33     |
| Organic Diseases of the Heart . . . . . | 1                                 | ..        | 4         | 3         | ..        | 8      | 2             | 4         | 12        | 20        | 16        | 1         | 55     |
| Dropsy . . . . .                        | ..                                | 4         | 17        | 25        | 6         | 52     | 3             | 16        | 56        | 94        | 71        | 11        | 251    |
| Cancers and Malignant Ulcers . . . . .  | ..                                | 1         | 13        | 8         | 5         | 27     | ..            | 2         | 22        | 20        | 14        | 6         | 64     |
| Apoplexy . . . . .                      | 2                                 | 10        | 21        | 52        | 27        | 112    | 7             | 29        | 69        | 151       | 116       | 20        | 392    |
| Old Age . . . . .                       | ..                                | ..        | ..        | ..        | 4         | 4      | ..            | ..        | ..        | 1         | 35        | 42        | 78     |
| Accidents . . . . .                     | ..                                | 2         | 3         | 3         | ..        | 8      | ..            | 6         | 11        | 13        | 6         | ..        | 36     |
| Murdered . . . . .                      | ..                                | ..        | ..        | ..        | ..        | ..     | ..            | 1         | 1         | ..        | ..        | ..        | 2      |
| Suicide . . . . .                       | 2                                 | 4         | 2         | 3         | ..        | 11     | 4             | 15        | 19        | 20        | 6         | ..        | 64     |
| Total . . . . .                         | 26                                | 136       | 190       | 226       | 94        | 672    | 70            | 445       | 739       | 828       | 590       | 135       | 2,807  |

It will thus be seen that, during the first ten years, 672 deaths happened; and during the whole period of twenty years, 2807 deaths.

## ABSTRACT I.

| DISEASE.                             | Ratio of Deaths from each of the Six Causes to the whole Mortality, during the Years |              |            |              |            |              |
|--------------------------------------|--------------------------------------------------------------------------------------|--------------|------------|--------------|------------|--------------|
|                                      | 1829—1838.                                                                           |              | 1839—1848. |              | 1829—1848. |              |
|                                      | Deaths.                                                                              | Per Centage. | Deaths.    | Per Centage. | Deaths.    | Per Centage. |
| Fever . . . . .                      | 125                                                                                  | 18·602       | 366        | 17·141       | 491        | 17·492       |
| Chronic Pulmonary Diseases . . . . . | 108                                                                                  | 16·071       | 350        | 16·392       | 458        | 16·317       |
| Apoplexy . . . . .                   | 112                                                                                  | 16·667       | 280        | 13·113       | 392        | 13·965       |
| Local Inflammation . . . . .         | 85                                                                                   | 12·649       | 299        | 14·003       | 384        | 13·680       |
| Chronic Abdominal Diseases . . . . . | 45                                                                                   | 6·696        | 229        | 10·725       | 274        | 9·761        |
| Dropsy . . . . .                     | 52                                                                                   | 7·738        | 199        | 9·320        | 251        | 8·942        |
| Total . . . . .                      | 527                                                                                  | 78·423       | 1,723      | 80·694       | 2,250      | 80·157       |



The preceding Table represents the ratio of deaths which have taken place from six principal classes of disease during each decennial period, and during the whole twenty years, without distinction of ages.

From a subsequent Table, it will be found that the average age of the assured varied, in the twenty years to which the preceding figures relate, from 43 years to 47 years, and hence might be expected an increased number of deaths from apoplexy, which is generally believed to press with greater intensity as age increases; such, however, it will be seen, is not the case, so far as the preceding facts are concerned, for, in the first decennial period, the deaths from apoplexy formed about 17 per cent. of the whole, while in the second ten, the deaths from that cause were a little above 13 per cent. only. There can be no doubt that this difference is, to a great extent, if not entirely, due to the small number of deaths included in the first period; and it will be, therefore, more advantageous to examine the results in connection with the number of lives exposed to the risk of mortality at the various terms of life. The following exhibits, therefore, the ratio of deaths per cent. to the population exposed to the risk of mortality from different causes, according to the preceding classification of disease:—

TABLE XI.

| DISEASE.                      | Ratio of Deaths from Different Causes during 1829 to 1848, at the following Ages. |                     |                |                     |                |                     |                |                     |                |                     |                |                     |                |                     |
|-------------------------------|-----------------------------------------------------------------------------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|
|                               | 17—30.                                                                            |                     | 31—40.         |                     | 41—50.         |                     | 51—60.         |                     | 61—70.         |                     | 71—83.         |                     | All Ages.      |                     |
|                               | Number of Lives at Risk during 1829—1848.                                         |                     |                |                     |                |                     |                |                     |                |                     |                |                     |                |                     |
|                               | 10,074                                                                            |                     | 46,884         |                     | 57,208         |                     | 36,421         |                     | 13,110         |                     | 1,393          |                     | 165,090        |                     |
|                               | No. of Deaths.                                                                    | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. |
| Fever .....                   | 17                                                                                | ·169                | 101            | ·215                | 143            | ·250                | 144            | ·395                | 71             | ·542                | 15             | 1·077               | 491            | ·297                |
| Influenza .....               | ..                                                                                | ..                  | 11             | ·023                | 12             | ·021                | 9              | ·025                | 12             | ·092                | 5              | ·359                | 49             | ·030                |
| Asiatic Cholera .....         | ..                                                                                | ..                  | 4              | ·009                | 12             | ·021                | 8              | ·022                | 5              | ·038                | ..             | ..                  | 29             | ·018                |
| Exanthemic Diseases .....     | 2                                                                                 | ·020                | 5              | ·011                | ..             | ..                  | 1              | ·003                | 1              | ·008                | ..             | ..                  | 9              | ·005                |
| Local Inflammation .....      | 12                                                                                | ·119                | 72             | ·154                | 106            | ·185                | 103            | ·283                | 75             | ·572                | 16             | 1·149               | 384            | ·233                |
| Gout and Rheumatism .....     | 4                                                                                 | ·040                | 13             | ·028                | 25             | ·044                | 22             | ·060                | 23             | ·175                | 2              | ·144                | 89             | ·054                |
| Chronic Pulmonary Diseases.   | 19                                                                                | ·189                | 115            | ·245                | 166            | ·290                | 111            | ·305                | 46             | ·351                | 1              | ·072                | 458            | ·277                |
| Chronic Abdominal Diseases.   | ..                                                                                | ..                  | 37             | ·079                | 65             | ·114                | 86             | ·236                | 74             | ·564                | 12             | ·861                | 274            | ·132                |
| Mental Affections .....       | ..                                                                                | ..                  | 9              | ·019                | 11             | ·019                | 18             | ·049                | 9              | ·069                | 2              | ·144                | 49             | ·030                |
| Diseases of Spinal Marrow ..  | ..                                                                                | ..                  | 5              | ·011                | 9              | ·016                | 7              | ·019                | 10             | ·076                | 2              | ·144                | 33             | ·020                |
| Organic Diseases of the Heart | 2                                                                                 | ·020                | 4              | ·009                | 12             | ·021                | 20             | ·055                | 16             | ·122                | 1              | ·072                | 55             | ·033                |
| Dropsy .....                  | 3                                                                                 | ·030                | 16             | ·034                | 56             | ·098                | 94             | ·258                | 71             | ·542                | 11             | ·790                | 251            | ·152                |
| Cancers and Malignant Ulcers  | ..                                                                                | ..                  | 2              | ·004                | 22             | ·038                | 20             | ·055                | 14             | ·107                | 6              | ·431                | 64             | ·039                |
| Apoplexy .....                | 7                                                                                 | ·069                | 29             | ·062                | 69             | ·121                | 151            | ·415                | 116            | ·885                | 20             | 1·436               | 392            | ·237                |
| Old Age .....                 | ..                                                                                | ..                  | ..             | ..                  | ..             | ..                  | 1              | ·003                | 35             | ·267                | 42             | 3·015               | 78             | ·047                |
| Accidents .....               | ..                                                                                | ..                  | 6              | ·013                | 11             | ·019                | 13             | ·036                | 6              | ·046                | ..             | ..                  | 36             | ·022                |
| Murdered .....                | ..                                                                                | ..                  | 1              | ·002                | 1              | ·002                | ..             | ..                  | ..             | ..                  | ..             | ..                  | 2              | ·001                |
| Suicide .....                 | 4                                                                                 | ·040                | 15             | ·032                | 19             | ·033                | 20             | ·055                | 6              | ·046                | ..             | ..                  | 64             | ·039                |
| All Diseases .....            | 70                                                                                | ·695                | 445            | ·949                | 739            | 1·291               | 828            | 2·273               | 590            | 4·560               | 135            | 9·691               | 2,807          | 1·703               |

In the class of disease denominated fever, in the preceding Table, it will be seen that the mortality uniformly increases from the younger to the older ages. With respect to the group of diseases “local inflammation,” it will be seen, that although there is an increase



in the rate of mortality from the younger to the older ages, still the difference is very slight under the age of 50, and the intensity greatest of all at the term of life 61-70. Again, with respect to "chronic pulmonary diseases," the bulk of the deaths took place between the ages of 31-70, and the rate of mortality increases from .245 per cent. in the term of life 31-40, to .351 per cent. at ages 61-70. In the class "chronic abdominal diseases," the mortality increases in a very rapid manner from the younger to the older ages, being only .079 per cent. at ages 31-40, and as much as .564 per cent. at ages 61-70. Similar results connect themselves with the deaths from dropsy: but in the section "apoplexy," the greatest variation is observable in connection with a difference of age; at the term of life 31-40, the mortality is .062 per cent., increasing rapidly till ages 71-83, in which it is 1.436 per cent. from this disease. This is in accordance with the received opinion of medical men on the character of this disease.

If the influence of the above mentioned six groups of diseases be now viewed in connection with specific terms of life, it will be seen that, in the decennial period, 31-40, the greatest rate of mortality has taken place from "pulmonary diseases," next from "fevers," then from "local inflammations," "abdominal diseases," "apoplexy," and least of all from "dropsy;" and in the next ten years of life, the mortality of these diseases follows the same order as to their intensity. In the term of life 51-60, however, the following is the order in which the same six diseases stand as to intensity:—apoplexy, fever, pulmonary diseases, inflammation, dropsy, and abdominal diseases. And in the ten years 61-70, the order is again varied, being apoplexy, inflammation, abdominal diseases, fever and dropsy equal, and pulmonary diseases at the bottom of the scale; and in the most advanced term of life of the preceding Abstract, the following is the order of intensity of the diseases:—apoplexy, inflammation, fever, abdominal diseases, dropsy, and pulmonary diseases. The following arrangement may perhaps exhibit these results in a more simple form:—

*Diseases arranged according to the order of their Intensity at the following Terms of Life.*

| 31-40.              | 41-50.              | 51-60.              | 61-70.              | 71-83.              |
|---------------------|---------------------|---------------------|---------------------|---------------------|
| Pulmonary Diseases. | Pulmonary Diseases. | Apoplexy.           | Apoplexy.           | Apoplexy.           |
| Fevers.             | Fevers.             | Fevers.             | Inflammations.      | Inflammations.      |
| Inflammations.      | Inflammations.      | Pulmonary Diseases. | Abdominal Diseases. | Fevers.             |
| Abdominal Diseases. | Abdominal Diseases. | Inflammations.      | Fevers. }           | Abdominal Diseases. |
| Apoplexy.           | Apoplexy.           | Dropsy.             | Dropsy. }           | Dropsy.             |
| Dropsy.             | Dropsy.             | Abdominal Diseases. | Pulmonary Diseases. | Pulmonary Diseases. |

Pulmonary disease is, therefore, so far as the preceding facts are concerned, essentially the disease of highest intensity in the destruction of life under 50, and above that age, apoplexy; the other diseases maintaining varying but intermediate positions in the scale of mortality.



The preceding classification of diseases, although it is that given in the Reports referred to, is evidently not sufficiently exact in its arrangement to merit much further criticism on the results; and it has therefore been thought desirable to classify the deaths according to a better nosological system. The whole of the deaths for the eleven years 1839-49, have, therefore, been so classified: the facts given not admitting of the deaths in the first ten years being so treated. It will be seen, that during the eleven years 1839-49, there have been 2471 deaths, and in the ten years 1829-38, there have been 672 deaths, making in all 3143, so that nearly 79 per cent. of the whole become subject to the more complete nosological classification. The information furnished respecting each death, not only gives the age and cause of death, but also the age at the time the life was assured; in every instance distinguishing the ages to the nearest month, so that a new and

TABLE  
Deaths in the Gotha Life Office from All

| CAUSES OF DEATH.                                                               | AGE.      |           |        |           |        |           |        |           |        |           |        |           |
|--------------------------------------------------------------------------------|-----------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
|                                                                                | Under 20. |           | 20-24. |           | 25-29. |           | 30-34. |           | 35-39. |           | 40-44. |           |
|                                                                                | No.       | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. |
|                                                                                |           | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |
| All Causes . . . . .                                                           | 1         | 1 5       | 3      | 6 9       | 37     | 117 10    | 113    | 391 2     | 217    | 1,129 4   | 278    | 1,851 1   |
| Specified Causes . . . . .                                                     | 1         | 1 5       | 3      | 6 9       | 37     | 117 10    | 113    | 391 2     | 217    | 1,129 4   | 278    | 1,851 1   |
| I. Zymotic Diseases . . . . .                                                  | ..        | ..        | 1      | 0 2       | 10     | 24 11     | 38     | 110 4     | 60     | 325 8     | 64     | 458 3     |
| SPORADIC DISEASES.                                                             |           |           |        |           |        |           |        |           |        |           |        |           |
| II. Dropsy, Cancer, and other Diseases of uncertain or variable seat . . . . . | ..        | ..        | ..     | ..        | 2      | 5 6       | 9      | 28 10     | 18     | 87 9      | 38     | 298 7     |
| III. Tubercular Diseases . . . . .                                             | ..        | ..        | 1      | 1 2       | 9      | 36 5      | 38     | 158 0     | 54     | 279 2     | 74     | 343 10    |
| IV. Diseases of the Brain, Spinal Marrow, Nerves, and Senses . . . . .         | ..        | ..        | ..     | ..        | 6      | 17 0      | 5      | 16 3      | 22     | 99 10     | 29     | 220 0     |
| V. Diseases of the Heart and Blood-vessels . . . . .                           | ..        | ..        | ..     | ..        | 1      | 1 6       | 1      | 1 1       | 7      | 33 8      | 6      | 65 9      |
| VI. Diseases of the Lungs and of the other Organs of Respiration . . . . .     | 1         | 1 5       | 1      | 5 5       | 4      | 10 10     | 9      | 33 4      | 26     | 126 1     | 29     | 190 5     |
| VII. Diseases of the Stomach, Liver, and other Organs of Digestion . . . . .   | ..        | ..        | ..     | ..        | 1      | 2 3       | 3      | 11 3      | 14     | 79 9      | 25     | 191 6     |
| VIII. Diseases of the Kidneys, &c. . . . .                                     | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 5      | 33 3      | 2      | 12 4      |
| IX. Childbirth, Diseases of the Uterus, &c. . . . .                            | ..        | ..        | ..     | ..        | ..     | ..        | 3      | 4 7       | ..     | ..        | ..     | ..        |
| X. Rheumatism, Diseases of the Bones, Joints, &c. . . . .                      | ..        | ..        | ..     | ..        | 1      | 7 7       | ..     | ..        | 2      | 12 6      | 1      | 1 1       |
| XI. Diseases of the Skin, Cellular Tissue, &c. . . . .                         | ..        | ..        | ..     | ..        | 1      | 3 5       | ..     | ..        | ..     | ..        | ..     | ..        |
| XIII. Debility . . . . .                                                       | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| XV. Age . . . . .                                                              | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| XVII. Violence, Privation, Cold, and Intemperance . . . . .                    | ..        | ..        | ..     | ..        | 2      | 8 5       | 7      | 27 6      | 9      | 51 8      | 10     | 69 4      |
| I. Small Pox . . . . .                                                         | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 13 4      |
| Measles . . . . .                                                              | ..        | ..        | ..     | ..        | ..     | ..        | 1      | 0 2       | ..     | ..        | ..     | ..        |
| Scarlatina . . . . .                                                           | ..        | ..        | ..     | ..        | 1      | 3 9       | 1      | 2 2       | ..     | ..        | ..     | ..        |
| Croup . . . . .                                                                | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Diarrhœa . . . . .                                                             | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Dysentery . . . . .                                                            | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 3      | 14 2      | 1      | 7 5       |
| Cholera . . . . .                                                              | ..        | ..        | ..     | ..        | ..     | ..        | 3      | 11 1      | 4      | 18 6      | 7      | 43 8      |
| Influenza . . . . .                                                            | ..        | ..        | ..     | ..        | ..     | ..        | 1      | 0 11      | 1      | 8 3       | 5      | 26 4      |
| Purpura and Scurvy . . . . .                                                   | ..        | ..        | ..     | ..        | 1      | 10 7      | ..     | ..        | ..     | ..        | ..     | ..        |
| Ague . . . . .                                                                 | ..        | ..        | ..     | ..        | ..     | ..        | 1      | 1 1       | ..     | ..        | ..     | ..        |
| Typhus . . . . .                                                               | ..        | ..        | 1      | 0 2       | 8      | 21 2      | 25     | 69 0      | 45     | 244 11    | 44     | 324 10    |
| Metria, or Puerperal Fever . . . . .                                           | ..        | ..        | ..     | ..        | ..     | ..        | 1      | 1 3       | 2      | 24 8      | ..     | ..        |
| Rheumatic Fever . . . . .                                                      | ..        | ..        | ..     | ..        | 1      | ..        | 5      | 24 8      | 4      | 8 0       | 3      | 18 9      |
| Erysipelas . . . . .                                                           | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 7 2       | 3      | 23 11     |
| II. Hæmorrhage . . . . .                                                       | ..        | ..        | ..     | ..        | 1      | 3 2       | 1      | 1 11      | 4      | 13 5      | 7      | 63 5      |
| Dropsy . . . . .                                                               | ..        | ..        | ..     | ..        | 1      | 2 4       | 7      | 23 7      | 8      | 32 11     | 21     | 155 7     |
| Ulcer . . . . .                                                                | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Mortification . . . . .                                                        | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Cancer . . . . .                                                               | ..        | ..        | ..     | ..        | ..     | ..        | 1      | 3 4       | 4      | 38 1      | 5      | 35 4      |
| Gout . . . . .                                                                 | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 2      | 3 4       | 5      | 44 3      |



important element in vital statistics is thus introduced, by which can be seen the facility with which different diseases may engraft themselves on the constitution at different terms of life, or, in other words, the rate at which the deterioration of life takes place from the standard of ordinary health, at different ages, from various diseases; for, with respect to all the lives now under consideration, at the time the assurances were effected, they underwent the usual scrutiny before admission into the Society.

In the following Table will be found an abstract of the number of deaths which have taken place at the various periods of life from different diseases; at the same time setting forth the period which has elapsed, in years and months, from the date of effecting the policies to the date of death:—

## XII.

*Causes, and Total Duration of Life after Assurance.*

## AGE.

| 45—49. |           | 50—54. |           | 55—59. |           | 60—64. |           | 65—69. |           | 70—74. |           | 75—79. |           | 80—85. |           | All Ages. |           |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|-----------|-----------|
| No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.       | Duration. |
|        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |           | Yrs. Ms.  |
| 313    | 2,551 10  | 334    | 2,961 8   | 363    | 3,534 3   | 355    | 3,834 0   | 271    | 3,336 1   | 139    | 2,005 11  | 42     | 690 1     | 5      | 96 4      | 2,471     | 22,507 9  |
| 312    | 2,546 3   | 330    | 2,935 0   | 361    | 3,521 6   | 355    | 3,834 0   | 270    | 3,328 5   | 139    | 2,005 11  | 42     | 690 1     | 5      | 96 4      | 2,463     | 22,455 1  |
| 67     | 507 6     | 64     | 557 9     | 66     | 571 8     | 59     | 641 4     | 43     | 528 1     | 20     | 278 0     | 9      | 145 1     | 2      | 39 0      | 503       | 4,187 9   |
| 49     | 432 8     | 46     | 406 11    | 66     | 604 2     | 72     | 631 3     | 47     | 611 0     | 25     | 375 5     | 8      | 124 8     | ..     | ..        | 380       | 3,606 11  |
| 66     | 575 1     | 67     | 634 6     | 54     | 611 5     | 49     | 566 4     | 20     | 239 3     | 5      | 68 2      | ..     | ..        | ..     | ..        | 437       | 3,513 4   |
| 45     | 367 7     | 58     | 529 2     | 63     | 600 7     | 62     | 726 9     | 53     | 654 2     | 26     | 378 3     | 6      | 103 3     | ..     | ..        | 375       | 3,712 10  |
| 11     | 85 0      | 10     | 112 7     | 19     | 149 6     | 12     | 139 10    | 2      | 31 0      | ..     | ..        | ..     | ..        | ..     | ..        | 69        | 619 11    |
| 28     | 189 7     | 33     | 197 3     | 34     | 379 1     | 32     | 356 4     | 39     | 465 9     | 13     | 168 1     | 2      | 31 10     | ..     | ..        | 251       | 2,155 5   |
| 20     | 138 1     | 26     | 250 11    | 37     | 397 3     | 41     | 419 0     | 25     | 309 11    | 12     | 187 9     | 3      | 53 8      | ..     | ..        | 207       | 2,052 10  |
| 4      | 44 4      | 6      | 47 6      | 3      | 21 9      | 10     | 127 4     | 8      | 92 11     | 2      | 21 9      | ..     | ..        | ..     | ..        | 40        | 401 2     |
| 5      | 47 2      | 1      | 8 9       | ..     | ..        | 1      | 10 0      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 10        | 70 6      |
| 5      | 52 0      | 2      | 16 0      | 1      | 10 10     | ..     | ..        | ..     | ..        | 1      | 14 1      | ..     | ..        | ..     | ..        | 13        | 114 1     |
| 1      | 9 5       | 1      | 7 2       | ..     | ..        | 1      | 19 7      | 1      | 9 3       | ..     | ..        | ..     | ..        | ..     | ..        | 5         | 48 10     |
| ..     | ..        | ..     | ..        | 1      | 6 11      | ..     | ..        | 3      | 44 6      | ..     | ..        | ..     | ..        | ..     | ..        | 4         | 51 5      |
| ..     | ..        | ..     | ..        | ..     | ..        | 6      | 65 4      | 24     | 295 4     | 35     | 514 3     | 14     | 231 7     | 3      | 57 4      | 82        | 1,163 10  |
| 11     | 97 10     | 16     | 166 6     | 17     | 168 4     | 10     | 138 0     | 5      | 49 3      | ..     | ..        | ..     | ..        | ..     | ..        | 87        | 796 0     |
| 1      | 6 6       | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 2         | 19 10     |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 0 2       |
| ..     | ..        | 1      | 1 1       | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 3         | 7 0       |
| ..     | ..        | 1      | 10 7      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 10 7      |
| ..     | ..        | ..     | ..        | ..     | ..        | 1      | 13 7      | ..     | ..        | 1      | 14 4      | ..     | ..        | ..     | ..        | 2         | 27 11     |
| 4      | 30 10     | 5      | 41 6      | 1      | 8 10      | 4      | 33 5      | 3      | 41 9      | 1      | 11 10     | 1      | 15 9      | ..     | ..        | 23        | 205 6     |
| 8      | 75 4      | 8      | 97 4      | 10     | 84 9      | 8      | 111 0     | 9      | 111 9     | 2      | 37 11     | 1      | 20 0      | ..     | ..        | 60        | 611 4     |
| 2      | 24 7      | 4      | 47 9      | 5      | 64 6      | 10     | 97 10     | 3      | 26 3      | 10     | 120 11    | 5      | 81 1      | 1      | 19 1      | 47        | 517 6     |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 10 7      |
| 1      | 8 9       | ..     | ..        | 6      | 44 7      | 2      | 17 7      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 10        | 72 0      |
| 44     | 327 0     | 42     | 343 11    | 36     | 290 3     | 28     | 286 4     | 25     | 308 11    | 5      | 62 8      | 2      | 28 3      | ..     | ..        | 305       | 2,307 5   |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 3         | 25 11     |
| 3      | 14 9      | 2      | 13 10     | 3      | 24 0      | 5      | 71 0      | 1      | 13 1      | ..     | ..        | ..     | ..        | 1      | 19 11     | 28        | 208 0     |
| 4      | 19 9      | 1      | 1 9       | 4      | 44 1      | 1      | 10 7      | 2      | 26 4      | 1      | 20 4      | ..     | ..        | ..     | ..        | 17        | 153 11    |
| 6      | 46 8      | 3      | 24 3      | 6      | 72 6      | 4      | 40 9      | 1      | 14 6      | ..     | ..        | 1      | 9 11      | ..     | ..        | 34        | 290 6     |
| 27     | 241 11    | 29     | 239 8     | 43     | 414 6     | 45     | 376 1     | 31     | 407 2     | 15     | 221 9     | 5      | 85 3      | ..     | ..        | 232       | 2,205 11  |
| ..     | ..        | ..     | ..        | 1      | 7 5       | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 7 5       |
| ..     | ..        | 3      | 27 11     | ..     | ..        | 2      | 18 4      | 1      | 5 5       | 2      | 37 2      | ..     | ..        | ..     | ..        | 8         | 88 10     |
| 9      | 93 11     | 8      | 85 10     | 12     | 108 1     | 15     | 128 2     | 10     | 133 2     | 4      | 57 11     | 2      | 29 6      | ..     | ..        | 70        | 713 4     |
| 7      | 50 2      | 3      | 29 3      | 4      | 15 1      | 6      | 67 11     | 4      | 51 9      | 4      | 58 9      | ..     | ..        | ..     | ..        | 35        | 320 6     |



TABLE XII.—

*Deaths in the Gotha Life Office from All*

| CAUSES OF DEATH.                        | AGE.      |           |        |           |        |           |        |           |        |           |        |           |
|-----------------------------------------|-----------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|
|                                         | Under 20. |           | 20—24. |           | 25—29. |           | 30—34. |           | 35—39. |           | 40—44. |           |
|                                         | No.       | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. |
|                                         |           | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |
| III. Scrofula . . . . .                 | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Tabes Mesenterica . . . . .             | ..        | ..        | ..     | ..        | ..     | ..        | 2      | 9 4       | 5      | 29 4      | 4      | 39 1      |
| Phthisis, or Consumption . . . . .      | ..        | ..        | 1      | 1 2       | 9      | 36 5      | 36     | 148 8     | 49     | 249 10    | 70     | 304 9     |
| IV. Cephalitis . . . . .                | ..        | ..        | ..     | ..        | ..     | ..        | 2      | 3 7       | 4      | 15 10     | 4      | 27 11     |
| Apoplexy . . . . .                      | ..        | ..        | ..     | ..        | 4      | 12 8      | ..     | ..        | 15     | 65 5      | 15     | 109 11    |
| Paralysis . . . . .                     | ..        | ..        | ..     | ..        | 1      | 0 10      | ..     | ..        | ..     | ..        | ..     | ..        |
| Insanity . . . . .                      | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 5 5       | 1      | 1 9       |
| Disease of the Brain, &c. . . . .       | ..        | ..        | ..     | ..        | 1      | 3 6       | 3      | 12 8      | 2      | 13 2      | 9      | 80 5      |
| V. Pericarditis . . . . .               | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 2      | 8 11      | ..     | ..        |
| Aneurism . . . . .                      | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 5 10      | 1      | 2 7       |
| Disease of the Heart . . . . .          | ..        | ..        | ..     | ..        | 1      | 1 6       | 1      | 1 1       | 4      | 18 11     | 5      | 63 2      |
| VI. Laryngitis . . . . .                | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 1 7       | ..     | ..        |
| Bronchitis . . . . .                    | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 0 2       | ..     | ..        |
| Pneumonia . . . . .                     | 1         | 1 5       | 1      | 5 5       | 4      | 10 10     | 9      | 33 4      | 23     | 119 11    | 29     | 190 5     |
| Asthma . . . . .                        | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Disease of Lungs . . . . .              | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 4 5       | ..     | ..        |
| VII. Quinsey . . . . .                  | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 4 4       | 1      | 1 5       |
| Gastritis . . . . .                     | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 5 7       |
| Enteritis . . . . .                     | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 7 10      | 3      | 17 11     |
| Peritonitis . . . . .                   | ..        | ..        | ..     | ..        | 1      | 2 3       | 2      | 9 1       | 5      | 24 3      | 3      | 28 4      |
| Ascites . . . . .                       | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 7 2       |
| Ulceration of Intestines, &c. . . . .   | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 6 7       | ..     | ..        |
| Hernia . . . . .                        | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Ileus . . . . .                         | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Intussusception . . . . .               | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Stricture of Intestinal Canal . . . . . | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Disease of Stomach, &c. . . . .         | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 4      | 31 6      | 4      | 34 9      |
| Hepatitis . . . . .                     | ..        | ..        | ..     | ..        | ..     | ..        | 1      | 2 2       | 1      | 4 7       | 4      | 28 10     |
| Jaundice . . . . .                      | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 12 0      |
| Disease of Liver . . . . .              | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 0 8       | 7      | 55 6      |
| Disease of Spleen . . . . .             | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| VIII. Nephritis . . . . .               | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Nephria, or Bright's Disease . . . . .  | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 3      | 23 3      | 1      | 1 7       |
| Diabetes . . . . .                      | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 0 11      | 1      | 10 9      |
| Stone . . . . .                         | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Cystitis . . . . .                      | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Disease of Kidneys, &c. . . . .         | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 9 1       | ..     | ..        |
| X. Arthritis . . . . .                  | ..        | ..        | ..     | ..        | 1      | 7 7       | ..     | ..        | 1      | 6 6       | ..     | ..        |
| Rheumatism . . . . .                    | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 6 0       | 1      | 1 1       |
| Disease of Joints, &c. . . . .          | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| XI. Phlegmon . . . . .                  | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Disease of Skin, &c. . . . .            | ..        | ..        | ..     | ..        | 1      | 3 5       | ..     | ..        | ..     | ..        | ..     | ..        |
| XII. Hanging, &c. . . . .               | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 9 4       |
| Fractures . . . . .                     | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Wounds . . . . .                        | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |
| Other Violence . . . . .                | ..        | ..        | ..     | ..        | 2      | 8 5       | 7      | 27 6      | 9      | 51 8      | 9      | 60 0      |
| Causes not specified . . . . .          | ..        | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        |

The preceding Table will be useful to enable those interested in the facts contained in it to effect other combinations which may suggest themselves; but Table XIII, which is deduced from it, is more particularly applicable to the immediate question,



(continued).

Causes, and Total Duration of Life after Assurance.

| AGE.   |           |        |           |        |           |        |           |        |           |        |           |        |           |        |           |           |           |
|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|--------|-----------|-----------|-----------|
| 45—49. |           | 50—54. |           | 55—59. |           | 60—64. |           | 65—69. |           | 70—74. |           | 75—79. |           | 80—85. |           | All Ages. |           |
| No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.    | Duration. | No.       | Duration. |
|        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |        | Yrs. Ms.  |           | Yrs. Ms.  |
| 2      | 5 3       | 1      | 15 2      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 3         | 20 5      |
| 1      | 4 4       | 1      | 4 11      | 6      | 61 6      | 6      | 61 4      | 6      | 64 5      | 1      | 11 9      | ..     | ..        | ..     | ..        | 32        | 286 0     |
| 63     | 565 6     | 65     | 614 5     | 48     | 549 11    | 43     | 505 0     | 14     | 174 10    | 4      | 56 5      | ..     | ..        | ..     | ..        | 402       | 3,206 11  |
| 6      | 58 7      | 3      | 19 2      | 2      | 16 9      | 3      | 31 5      | 3      | 35 5      | 1      | 15 1      | ..     | ..        | ..     | ..        | 28        | 223 9     |
| 34     | 270 11    | 38     | 360 10    | 50     | 475 11    | 48     | 566 9     | 45     | 560 8     | 19     | 275 1     | 6      | 103 3     | ..     | ..        | 274       | 2,734 11  |
| 1      | 1 2       | 3      | 19 0      | 1      | 8 2       | 1      | 13 1      | 3      | 36 11     | 2      | 25 8      | ..     | ..        | ..     | ..        | 12        | 104 10    |
| ..     | ..        | 3      | 18 3      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 5         | 25 5      |
| 4      | 36 11     | 11     | 111 11    | 10     | 99 9      | 10     | 115 6     | 2      | 21 2      | 4      | 62 5      | ..     | ..        | ..     | ..        | 56        | 557 3     |
| ..     | ..        | 2      | 13 7      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 4         | 22 6      |
| 1      | 5 8       | ..     | ..        | 1      | 8 4       | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 4         | 22 5      |
| 10     | 79 4      | 8      | 99 0      | 18     | 141 2     | 12     | 139 10    | 2      | 30 1      | ..     | ..        | ..     | ..        | ..     | ..        | 61        | 574 1     |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 1 7       |
| 1      | 15 1      | ..     | ..        | 2      | 26 1      | 5      | 53 10     | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 9         | 95 2      |
| 25     | 157 11    | 33     | 197 3     | 30     | 332 2     | 22     | 247 11    | 37     | 432 7     | 12     | 152 7     | 2      | 31 10     | ..     | ..        | 229       | 1,945 3   |
| ..     | ..        | ..     | ..        | ..     | ..        | 2      | 23 6      | 2      | 33 2      | 1      | 15 6      | ..     | ..        | ..     | ..        | 5         | 72 2      |
| 2      | 16 7      | ..     | ..        | 2      | 20 10     | 2      | 31 1      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 7         | 72 11     |
| ..     | ..        | 1      | 10 2      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 3         | 15 11     |
| 1      | 10 1      | 1      | 8 3       | 1      | 7 8       | 2      | 9 9       | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 6         | 41 4      |
| 1      | 8 2       | 2      | 20 9      | 1      | 10 10     | 2      | 7 2       | ..     | ..        | 1      | 16 6      | ..     | ..        | ..     | ..        | 11        | 89 2      |
| 4      | 16 9      | 6      | 49 3      | 5      | 53 4      | 4      | 35 2      | 4      | 49 4      | 1      | 19 1      | ..     | ..        | ..     | ..        | 35        | 286 10    |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 7 2       |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 6 7       |
| ..     | ..        | ..     | ..        | ..     | ..        | 1      | 3 3       | 1      | 13 6      | ..     | ..        | ..     | ..        | ..     | ..        | 2         | 16 9      |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 13 0      | ..     | ..        | ..     | ..        | 1         | 13 0      |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 13 4      | ..     | ..        | ..     | ..        | 1         | 13 4      |
| ..     | ..        | ..     | ..        | 1      | 14 0      | 1      | 16 4      | 1      | 13 11     | ..     | ..        | 1      | 13 11     | ..     | ..        | 4         | 68 2      |
| 7      | 64 10     | 7      | 51 0      | 13     | 131 5     | 11     | 129 8     | 9      | 114 10    | 3      | 42 6      | 1      | 19 10     | ..     | ..        | 59        | 681 2     |
| 1      | 10 2      | 2      | 7 4       | 6      | 58 0      | 6      | 44 10     | 2      | 27 1      | 1      | 17 1      | 1      | 19 11     | ..     | ..        | 25        | 220 0     |
| ..     | ..        | ..     | ..        | 2      | 23 5      | 3      | 52 8      | ..     | ..        | 1      | 14 5      | ..     | ..        | ..     | ..        | 7         | 102 6     |
| 6      | 28 1      | 7      | 59 2      | 7      | 83 8      | 10     | 118 0     | 7      | 83 11     | 3      | 51 10     | ..     | ..        | ..     | ..        | 48        | 542 6     |
| ..     | ..        | ..     | ..        | 1      | 14 11     | 1      | 2 2       | 1      | 7 4       | ..     | ..        | ..     | ..        | ..     | ..        | 3         | 24 5      |
| 1      | 7 2       | ..     | ..        | ..     | ..        | 1      | 17 10     | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 2         | 25 0      |
| 1      | 11 3      | 1      | 12 8      | ..     | ..        | 1      | 15 6      | 1      | 20 4      | ..     | ..        | ..     | ..        | ..     | ..        | 8         | 84 7      |
| 1      | 11 6      | 2      | 15 11     | 1      | 9 10      | 2      | 25 8      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 8         | 74 8      |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 10 1      | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 10 1      |
| ..     | ..        | ..     | ..        | ..     | ..        | 1      | 12 2      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 12 2      |
| 1      | 14 5      | 3      | 18 11     | 2      | 11 11     | 5      | 56 2      | 6      | 62 6      | 2      | 21 9      | ..     | ..        | ..     | ..        | 20        | 194 9     |
| 1      | 17 3      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 3         | 31 6      |
| 3      | 19 6      | 2      | 16 0      | 1      | 10 10     | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 8         | 53 5      |
| 1      | 15 3      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1      | 14 1      | ..     | ..        | ..     | ..        | 2         | 29 4      |
| ..     | ..        | ..     | ..        | ..     | ..        | 1      | 19 7      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 19 7      |
| 1      | 9 5       | 1      | 7 2       | ..     | ..        | ..     | ..        | 1      | 9 3       | ..     | ..        | ..     | ..        | ..     | ..        | 4         | 29 3      |
| ..     | ..        | ..     | ..        | 1      | 10 3      | 1      | 18 9      | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 1         | 9 4       |
| ..     | ..        | ..     | ..        | 1      | 15 2      | ..     | ..        | 1      | 6 2       | ..     | ..        | ..     | ..        | ..     | ..        | 2         | 29 0      |
| ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | ..     | ..        | 2         | 21 4      |
| 11     | 97 10     | 16     | 166 6     | 15     | 142 11    | 9      | 119 3     | 4      | 43 1      | ..     | ..        | ..     | ..        | ..     | ..        | 82        | 704 0     |
| 1      | 5 7       | 4      | 26 8      | 2      | 12 9      | ..     | ..        | 1      | 7 8       | ..     | ..        | ..     | ..        | ..     | ..        | 8         | 52 8      |

and differs from Table XII only in giving the average period, instead of the absolute period, which elapsed from the date of assuring to that of death.



Deaths in the Gotha Life Office from All

| CAUSES OF DEATH.                                                               | AGE.      |                   |        |                   |        |                   |        |                   |        |                   |        |                   |
|--------------------------------------------------------------------------------|-----------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|
|                                                                                | Under 20. |                   | 20—24. |                   | 25—29. |                   | 30—34. |                   | 35—39. |                   | 40—44. |                   |
|                                                                                | No.       | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. |
| All Causes . . . . .                                                           | 1         | Yrs. Ms. 1 5      | 3      | Yrs. Ms. 2 3      | 37     | Yrs. Ms. 3 2      | 113    | Yrs. Ms. 3 6      | 217    | Yrs. Ms. 5 2      | 278    | Yrs. Ms. 6 8      |
| Specified Causes . . . . .                                                     | 1         | 1 5               | 3      | 2 3               | 37     | 3 2               | 113    | 3 6               | 217    | 5 2               | 278    | 6 8               |
| I. Zymotic Diseases . . . . .                                                  | ..        | ..                | 1      | 0 2               | 10     | 2 5               | 38     | 2 11              | 60     | 5 5               | 64     | 7 2               |
| SPORADIC DISEASES.                                                             |           |                   |        |                   |        |                   |        |                   |        |                   |        |                   |
| II. Dropsy, Cancer, and other Diseases of uncertain or variable seat . . . . . | ..        | ..                | ..     | ..                | 2      | 2 9               | 9      | 3 2               | 18     | 4 10              | 38     | 7 7               |
| III. Tubercular Diseases . . . . .                                             | ..        | ..                | 1      | 1 2               | 9      | 4 0               | 38     | 4 1               | 54     | 5 2               | 74     | 4 8               |
| IV. Diseases of the Brain, Spinal Marrow, Nerves, and Senses . . . . .         | ..        | ..                | ..     | ..                | 6      | 2 10              | 5      | 3 3               | 22     | 4 6               | 29     | 7 7               |
| V. Diseases of the Heart and Blood-vessels . . . . .                           | ..        | ..                | ..     | ..                | 1      | 1 6               | 1      | 1 1               | 7      | 4 9               | 6      | 10 11             |
| VI. Diseases of the Lungs and of the other Organs of Respiration . . . . .     | 1         | 1 5               | 1      | 5 5               | 4      | 2 8               | 9      | 3 8               | 26     | 4 10              | 29     | 6 7               |
| VII. Diseases of the Stomach, Liver, and other Organs of Digestion . . . . .   | ..        | ..                | ..     | ..                | 1      | 2 3               | 3      | 3 0               | 14     | 5 8               | 25     | 7 8               |
| VIII. Diseases of the Kidneys, &c. . . . .                                     | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 5      | 6 7               | 2      | 6 2               |
| IX. Childbirth, Diseases of the Uterus, &c. . . . .                            | ..        | ..                | ..     | ..                | ..     | ..                | 3      | 1 6               | ..     | ..                | ..     | ..                |
| X. Rheumatism, Diseases of the Bones, Joints, &c. . . . .                      | ..        | ..                | ..     | ..                | 1      | 7 7               | ..     | ..                | 2      | 6 3               | 1      | 1 1               |
| XI. Diseases of the Skin, Cellular Tissue, &c. . . . .                         | ..        | ..                | ..     | ..                | 1      | 3 5               | ..     | ..                | ..     | ..                | ..     | ..                |
| XIII. Debility . . . . .                                                       | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| XV. Age . . . . .                                                              | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| XVII. Violence, Privation, Cold, and Intemperance . . . . .                    | ..        | ..                | ..     | ..                | 2      | 4 2               | 7      | 3 11              | 9      | 5 8               | 10     | 6 11              |
| I. Small Pox . . . . .                                                         | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 13 4              |
| Measles . . . . .                                                              | ..        | ..                | ..     | ..                | ..     | ..                | 1      | 0 2               | ..     | ..                | ..     | ..                |
| Scarlatina . . . . .                                                           | ..        | ..                | ..     | ..                | 1      | 3 9               | 1      | 2 2               | ..     | ..                | ..     | ..                |
| Croup . . . . .                                                                | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Diarrhœa . . . . .                                                             | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Dysentery . . . . .                                                            | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 3      | 4 8               | 1      | 7 5               |
| Cholera . . . . .                                                              | ..        | ..                | ..     | ..                | ..     | ..                | 3      | 3 8               | 4      | 4 7               | 7      | 6 2               |
| Influenza . . . . .                                                            | ..        | ..                | ..     | ..                | ..     | ..                | 1      | 1 11              | 1      | 8 3               | 5      | 5 3               |
| Purpura and Scurvy . . . . .                                                   | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Ague . . . . .                                                                 | ..        | ..                | ..     | ..                | ..     | ..                | 1      | 1 1               | ..     | ..                | ..     | ..                |
| Typhus . . . . .                                                               | ..        | ..                | 1      | 0 2               | 8      | 2 7               | 25     | 2 9               | 45     | 5 5               | 44     | 7 4               |
| Metria, or Puerperal Fever . . . . .                                           | ..        | ..                | ..     | ..                | ..     | ..                | 1      | 1 3               | 2      | 12 4              | ..     | ..                |
| Rheumatic Fever . . . . .                                                      | ..        | ..                | ..     | ..                | 1      | ..                | 5      | 4 11              | 4      | 2 0               | 3      | 6 3               |
| Erysipelas . . . . .                                                           | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 7 2               | 3      | 7 11              |
| II. Hæmorrhage . . . . .                                                       | ..        | ..                | ..     | ..                | 1      | 3 2               | 1      | 1 11              | 4      | 3 4               | 7      | 9 1               |
| Dropsy . . . . .                                                               | ..        | ..                | ..     | ..                | 1      | 2 4               | 7      | 3 4               | 8      | 4 1               | 21     | 7 5               |
| Ulcer . . . . .                                                                | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Mortification . . . . .                                                        | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Cancer . . . . .                                                               | ..        | ..                | ..     | ..                | ..     | ..                | 1      | 3 4               | 4      | 9 6               | 5      | 7 1               |
| Gout . . . . .                                                                 | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 2      | 1 8               | 5      | 8 10              |
| III. Scrofula . . . . .                                                        | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Tabes Mesenterica . . . . .                                                    | ..        | ..                | ..     | ..                | ..     | ..                | 2      | 4 8               | 5      | 5 10              | 4      | 9 9               |
| Phthisis, or Consumption . . . . .                                             | ..        | ..                | 1      | 1 2               | 9      | 4 1               | 36     | 4 2               | 49     | 5 1               | 70     | 4 4               |
| IV. Cephalitis . . . . .                                                       | ..        | ..                | ..     | ..                | ..     | ..                | 2      | 1 9               | 4      | 4 0               | 4      | 7 0               |
| Apoplexy . . . . .                                                             | ..        | ..                | ..     | ..                | 4      | 3 2               | ..     | ..                | 15     | 4 4               | 15     | 7 4               |
| Paralysis . . . . .                                                            | ..        | ..                | ..     | ..                | 1      | 0 10              | ..     | ..                | ..     | ..                | ..     | ..                |
| Insanity . . . . .                                                             | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 5 5               | 1      | 1 9               |
| Disease of the Brain, &c. . . . .                                              | ..        | ..                | ..     | ..                | 1      | 3 6               | 3      | 4 3               | 2      | 6 7               | 9      | 8 11              |
| V. Pericarditis . . . . .                                                      | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 2      | 4 5               | ..     | ..                |
| Aneurism . . . . .                                                             | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 5 10              | 1      | 2 7               |
| Disease of Heart . . . . .                                                     | ..        | ..                | ..     | ..                | 1      | 1 6               | 1      | 1 1               | 4      | 4 9               | 5      | 12 8              |
| VI. Laryngitis . . . . .                                                       | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 1 7               | ..     | ..                |
| Bronchitis . . . . .                                                           | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 0 2               | ..     | ..                |
| Pneumonia . . . . .                                                            | 1         | 1 5               | 1      | 5 5               | 4      | 2 9               | 9      | 3 8               | 23     | 5 9               | 29     | 6 7               |
| Asthma . . . . .                                                               | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Disease of Lungs . . . . .                                                     | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 4 5               | ..     | ..                |



## XIII.

*Causes, and Average Duration.*

| AGE.   |                   |     |        |                   |     |        |                   |     |        |                   |     |        |                   |     |        |                   |     |        |                   |     |        |                   |     |           |                   |     |
|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|-----------|-------------------|-----|
| 45—49. |                   |     | 50—54. |                   |     | 55—59. |                   |     | 60—64. |                   |     | 65—69. |                   |     | 70—74. |                   |     | 75—79. |                   |     | 80—85. |                   |     | All Ages. |                   |     |
| No.    | Average Duration. |     | No.    | Average Duration. |     | No.    | Average Duration. |     | No.    | Average Duration. |     | No.    | Average Duration. |     | No.    | Average Duration. |     | No.    | Average Duration. |     | No.    | Average Duration. |     | No.       | Average Duration. |     |
|        | Yrs.              | Ms. |        | Yrs.              | Ms. |        | Yrs.              | Ms. |        | Yrs.              | Ms. |        | Yrs.              | Ms. |        | Yrs.              | Ms. |        | Yrs.              | Ms. |        | Yrs.              | Ms. |           | Yrs.              | Ms. |
| 313    | 8                 | 2   | 334    | 8                 | 10  | 363    | 9                 | 8   | 355    | 10                | 10  | 271    | 12                | 4   | 139    | 14                | 9   | 42     | 16                | 6   | 5      | 19                | 3   | 2,471     | 9                 | 1   |
| 312    | 8                 | 2   | 330    | 8                 | 11  | 361    | 9                 | 9   | 355    | 10                | 10  | 270    | 12                | 4   | 139    | 14                | 9   | 42     | 16                | 6   | 5      | 19                | 3   | 2,463     | 9                 | 1   |
| 67     | 7                 | 7   | 64     | 8                 | 9   | 66     | 8                 | 8   | 59     | 10                | 1   | 43     | 12                | 3   | 20     | 13                | 5   | 9      | 16                | 1   | 2      | 19                | 6   | 503       | 8                 | 4   |
| 49     | 8                 | 10  | 46     | 8                 | 10  | 66     | 9                 | 2   | 72     | 8                 | 9   | 47     | 13                | 0   | 25     | 15                | 0   | 8      | 15                | 7   | ..     | ..                | 380 | 9         | 6                 |     |
| 66     | 8                 | 9   | 67     | 9                 | 6   | 54     | 11                | 4   | 49     | 11                | 7   | 20     | 12                | 0   | 5      | 13                | 7   | ..     | ..                | ..  | ..     | 437               | 8   | 0         |                   |     |
| 45     | 8                 | 2   | 58     | 9                 | 2   | 63     | 9                 | 6   | 62     | 11                | 8   | 53     | 12                | 4   | 26     | 14                | 7   | 6      | 17                | 2   | ..     | ..                | 375 | 9         | 2                 |     |
| 11     | 7                 | 9   | 10     | 11                | 3   | 19     | 7                 | 10  | 12     | 11                | 8   | 2      | 15                | 6   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 69  | 9         | 0                 |     |
| 28     | 6                 | 5   | 33     | 6                 | 0   | 34     | 11                | 2   | 32     | 11                | 2   | 39     | 11                | 11  | 13     | 12                | 11  | 2      | 15                | 11  | ..     | ..                | 251 | 8         | 7                 |     |
| 20     | 6                 | 11  | 26     | 9                 | 8   | 37     | 10                | 9   | 41     | 10                | 3   | 25     | 12                | 4   | 12     | 15                | 8   | 3      | 17                | 10  | ..     | ..                | 207 | 9         | 1                 |     |
| 4      | 11                | 1   | 6      | 7                 | 11  | 3      | 7                 | 3   | 10     | 12                | 8   | 8      | 11                | 7   | 2      | 10                | 10  | ..     | ..                | ..  | ..     | 40                | 10  | 0         |                   |     |
| 5      | 9                 | 5   | 1      | 8                 | 9   | ..     | ..                | ..  | 1      | 10                | 0   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 10  | 7         | 1                 |     |
| 5      | 10                | 4   | 2      | 8                 | 0   | 1      | 10                | 10  | 1      | 14                | 1   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 13  | 8         | 9                 |     |
| 1      | 9                 | 5   | 1      | 7                 | 2   | ..     | ..                | ..  | 1      | 19                | 7   | 1      | 9                 | 3   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 5   | 9         | 9                 |     |
| ..     | ..                | ..  | ..     | ..                | ..  | 1      | 6                 | 11  | ..     | ..                | ..  | 3      | 14                | 10  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 4   | 14        | 4                 |     |
| ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | 6      | 10                | 10  | 24     | 12                | 4   | 35     | 14                | 11  | 14     | 16                | 7   | 3      | 19                | 1   | 82        | 44                | 2   |
| 11     | 8                 | 11  | 16     | 10                | 5   | 17     | 7                 | 11  | 10     | 13                | 10  | 5      | 9                 | 10  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 87  | 8         | 10                |     |
| 1      | 6                 | 6   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 2   | 9         | 11                |     |
| ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 1   | 0         | 2                 |     |
| ..     | ..                | ..  | 1      | 1                 | 1   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 3   | 2         | 4                 |     |
| ..     | ..                | ..  | 1      | 10                | 7   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 1   | 10        | 7                 |     |
| ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | 1      | 13                | 7   | ..     | ..                | ..  | 1      | 14                | 4   | ..     | ..                | ..  | ..     | ..                | 2   | 13        | 11                |     |
| 4      | 7                 | 8   | 5      | 8                 | 3   | 1      | 8                 | 10  | 4      | 8                 | 4   | 3      | 13                | 11  | 1      | 11                | 10  | 1      | 15                | 9   | ..     | ..                | 23  | 8         | 11                |     |
| 8      | 9                 | 5   | 8      | 12                | 2   | 10     | 8                 | 5   | 8      | 13                | 10  | 9      | 12                | 5   | 2      | 18                | 11  | 1      | 20                | 0   | ..     | ..                | 60  | 10        | 2                 |     |
| 2      | 12                | 3   | 4      | 11                | 11  | 5      | 12                | 10  | 10     | 9                 | 9   | 3      | 8                 | 9   | 10     | 12                | 1   | 5      | 16                | 2   | 1      | 19                | 1   | 47        | 11                | 0   |
| ..     | ..                | ..  | ..     | ..                | ..  | 1      | 10                | 7   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 1   | 10        | 7                 |     |
| 1      | 8                 | 9   | ..     | ..                | ..  | 6      | 7                 | 4   | 2      | 8                 | 9   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 10  | 7         | 2                 |     |
| 44     | 7                 | 5   | 42     | 8                 | 2   | 36     | 8                 | 0   | 28     | 10                | 2   | 25     | 12                | 4   | 5      | 12                | 6   | 2      | 14                | 2   | ..     | ..                | 305 | 7         | 9                 |     |
| ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 3   | 8         | 8                 |     |
| 3      | 4                 | 11  | 2      | 6                 | 11  | 3      | 8                 | 0   | 5      | 14                | 2   | 1      | 13                | 1   | ..     | ..                | ..  | ..     | ..                | ..  | 1      | 19                | 11  | 28        | 7                 | 5   |
| 4      | 4                 | 11  | 1      | 1                 | 9   | 4      | 11                | 0   | 1      | 10                | 7   | 2      | 13                | 2   | 1      | 20                | 4   | ..     | ..                | ..  | ..     | ..                | 17  | 9         | 1                 |     |
| 6      | 7                 | 9   | 3      | 8                 | 1   | 6      | 12                | 1   | 4      | 10                | 2   | 1      | 14                | 6   | ..     | ..                | ..  | 1      | 9                 | 11  | ..     | ..                | 34  | 8         | 7                 |     |
| 27     | 9                 | 0   | 29     | 8                 | 3   | 43     | 9                 | 8   | 45     | 8                 | 4   | 31     | 13                | 2   | 15     | 14                | 9   | 5      | 17                | 1   | ..     | ..                | 232 | 9         | 7                 |     |
| ..     | ..                | ..  | ..     | ..                | ..  | 1      | 7                 | 5   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 1   | 7         | 5                 |     |
| ..     | ..                | ..  | 3      | 9                 | 4   | ..     | ..                | ..  | 2      | 9                 | 2   | 1      | 5                 | 5   | 2      | 18                | 7   | ..     | ..                | ..  | ..     | ..                | 8   | 11        | 1                 |     |
| 9      | 10                | 5   | 8      | 10                | 9   | 12     | 9                 | 0   | 15     | 8                 | 7   | 10     | 13                | 4   | 4      | 14                | 6   | 2      | 14                | 9   | ..     | ..                | 70  | 10        | 2                 |     |
| 7      | 7                 | 2   | 3      | 9                 | 9   | 4      | 3                 | 9   | 6      | 11                | 4   | 4      | 12                | 11  | 4      | 14                | 8   | ..     | ..                | ..  | ..     | ..                | 35  | 9         | 2                 |     |
| 2      | 2                 | 7   | 1      | 15                | 2   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 3   | 6         | 10                |     |
| 1      | 4                 | 4   | 1      | 4                 | 11  | 6      | 10                | 3   | 6      | 10                | 3   | 6      | 10                | 9   | 1      | 11                | 9   | ..     | ..                | ..  | ..     | ..                | 32  | 8         | 11                |     |
| 63     | 9                 | 0   | 65     | 9                 | 5   | 48     | 11                | 5   | 43     | 11                | 9   | 14     | 12                | 6   | 4      | 14                | 1   | ..     | ..                | ..  | ..     | ..                | 402 | 8         | 0                 |     |
| 6      | 9                 | 9   | 3      | 6                 | 4   | 2      | 8                 | 4   | 3      | 10                | 6   | 3      | 11                | 10  | 1      | 15                | 1   | ..     | ..                | ..  | ..     | ..                | 28  | 8         | 0                 |     |
| 34     | 8                 | 0   | 38     | 9                 | 6   | 50     | 9                 | 6   | 48     | 11                | 10  | 45     | 12                | 6   | 19     | 14                | 6   | 6      | 17                | 3   | ..     | ..                | 274 | 10        | 0                 |     |
| 1      | 1                 | 2   | 3      | 6                 | 4   | 1      | 8                 | 2   | 1      | 13                | 1   | 3      | 12                | 4   | 2      | 12                | 10  | ..     | ..                | ..  | ..     | ..                | 12  | 8         | 9                 |     |
| ..     | ..                | ..  | 3      | 6                 | 1   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 5   | 5         | 1                 |     |
| 4      | 9                 | 3   | 11     | 10                | 2   | 10     | 10                | 0   | 10     | 11                | 7   | 2      | 10                | 7   | 4      | 15                | 7   | ..     | ..                | ..  | ..     | ..                | 56  | 7         | 11                |     |
| ..     | ..                | ..  | 2      | 6                 | 9   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 4   | 5         | 7                 |     |
| 1      | 5                 | 8   | ..     | ..                | ..  | 1      | 8                 | 4   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 4   | 5         | 7                 |     |
| 10     | 7                 | 11  | 8      | 12                | 5   | 18     | 17                | 10  | 12     | 11                | 8   | 2      | 15                | 0   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 61  | 9         | 5                 |     |
| ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 1   | 1         | 7                 |     |
| 1      | 15                | 1   | ..     | ..                | ..  | 2      | 13                | 0   | 5      | 10                | 9   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 9   | 10        | 7                 |     |
| 25     | 6                 | 3   | 33     | 5                 | 11  | 30     | 11                | 1   | 23     | 10                | 9   | 37     | 11                | 8   | 12     | 12                | 9   | 2      | 15                | 11  | ..     | ..                | 229 | 8         | 4                 |     |
| ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | 2      | 11                | 9   | 2      | 16                | 7   | 1      | 15                | 6   | ..     | ..                | ..  | ..     | ..                | 5   | 14        | 5                 |     |
| 2      | 8                 | 3   | ..     | ..                | ..  | 2      | 10                | 5   | 2      | 15                | 7   | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | ..  | ..     | ..                | 7   | 10        | 5                 |     |



TABLE XIII.—

*Deaths in the Gotha Life Office from All*

| CAUSES OF DEATH.                        | AGE.      |                   |        |                   |        |                   |        |                   |        |                   |        |                   |
|-----------------------------------------|-----------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|
|                                         | Under 20. |                   | 20—24. |                   | 25—29. |                   | 30—34. |                   | 35—39. |                   | 40—44. |                   |
|                                         | No.       | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. |
|                                         |           | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |
| VII. Quinsey . . . . .                  | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 4 4               | 1      | 1 5               |
| Gastritis . . . . .                     | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 5 7               |
| Enteritis . . . . .                     | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 7 10              | 3      | 5 11              |
| Peritonitis . . . . .                   | ..        | ..                | ..     | ..                | 1      | 2 3               | 2      | 4 7               | 5      | 4 10              | 3      | 9 5               |
| Ascites . . . . .                       | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 7 2               |
| Ulceration of Intestines, &c. . . . .   | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 6 7               | ..     | ..                |
| Hernia . . . . .                        | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Ileus . . . . .                         | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Intussusception . . . . .               | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Stricture of Intestinal Canal . . . . . | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Disease of Stomach, &c. . . . .         | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 4      | 7 10              | 4      | 8 8               |
| Hepatitis . . . . .                     | ..        | ..                | ..     | ..                | ..     | ..                | 1      | 2 2               | 1      | 4 7               | 4      | 7 3               |
| Jaundice . . . . .                      | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 12 0              |
| Disease of Liver . . . . .              | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 0 8               | 7      | 7 11              |
| Disease of Spleen . . . . .             | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| VIII. Nephritis . . . . .               | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Nephria, or Bright's Disease . . . . .  | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 3      | 7 9               | 1      | 1 7               |
| Diabetes . . . . .                      | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 0 11              | 1      | 10 9              |
| Stone . . . . .                         | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Cystitis . . . . .                      | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Disease of Kidneys, &c. . . . .         | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 9 1               | ..     | ..                |
| X. Arthritis . . . . .                  | ..        | ..                | ..     | ..                | 1      | 7 7               | ..     | ..                | 1      | 6 6               | ..     | ..                |
| Rheumatism . . . . .                    | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 6 0               | 1      | 1 1               |
| Disease of Joints, &c. . . . .          | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| XI. Phlegmon . . . . .                  | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Disease of Skin, &c. . . . .            | ..        | ..                | ..     | ..                | 1      | 3 5               | ..     | ..                | ..     | ..                | ..     | ..                |
| XII. Hanging, &c. . . . .               | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 9 4               |
| Fractures . . . . .                     | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Wounds . . . . .                        | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |
| Other Violence . . . . .                | ..        | ..                | ..     | ..                | 2      | 4 2               | 7      | 3 11              | 9      | 5 8               | 9      | 6 8               |
| Causes not specified . . . . .          | ..        | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                |

In this Table it will be found that the causes of death are unspecified in eight only out of the 2471 cases recorded. The results herein given are so novel, but yet so varied that it will be impossible to discuss them fully within the limits of this paper, and only the most obvious will therefore be brought under consideration. In Abstract C, preceding, it was seen that, measuring the period which elapsed from the date of effecting the policies to the date of death, the interval was less for young lives than for older ones; and here, by adopting the opposite test, of measuring the interval from the date of death to the date of assuring, the same law is found to prevail, although in a more remarkable degree; and this difference is evidently owing to the circumstance, that all deaths among policies of long standing must necessarily be included in the more advanced periods of life in Table XIII, but included in younger periods of life in Abstract C. However, as the same law shews itself in both classes of results, and differing only in degree, the



(continued).

Causes, and Average Duration.

## AGE.

| 45—49. |                   | 50—54. |                   | 55—59. |                   | 60—64. |                   | 65—69. |                   | 70—74. |                   | 75—79. |                   | 80—85. |                   | All Ages. |                   |  |
|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|-----------|-------------------|--|
| No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.    | Average Duration. | No.       | Average Duration. |  |
|        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |        | Yrs. Ms.          |           | Yrs. Ms.          |  |
| ..     | ..                | 1      | 10 2              | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 3         | 5 4               |  |
| 1      | 10 1              | 1      | 8 3               | 1      | 7 8               | 2      | 4 11              | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 6         | 6 11              |  |
| 1      | 8 2               | 2      | 10 5              | 1      | 10 10             | 2      | 3 7               | ..     | ..                | 1      | 16 6              | ..     | ..                | ..     | ..                | 11        | 8 1               |  |
| 4      | 4 2               | 6      | 8 2               | 5      | 10 8              | 4      | 8 9               | 4      | 12 4              | 1      | 19 1              | ..     | ..                | ..     | ..                | 35        | 8 2               |  |
| ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1         | 7 2               |  |
| ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1         | 6 7               |  |
| ..     | ..                | ..     | ..                | ..     | ..                | 1      | 3 3               | 1      | 13 6              | ..     | ..                | ..     | ..                | ..     | ..                | 2         | 8 4               |  |
| ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 13 0              | ..     | ..                | ..     | ..                | 1         | 13 0              |  |
| ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 13 4              | ..     | ..                | ..     | ..                | 1         | 13 4              |  |
| ..     | ..                | ..     | ..                | 1      | 14 0              | 1      | 16 4              | 1      | 13 4              | ..     | ..                | 1      | 13 11             | ..     | ..                | 4         | 14 6              |  |
| 7      | 9 3               | 7      | 7 3               | 13     | 10 1              | 11     | 11 8              | 4      | 12 8              | 3      | 14 2              | 1      | 19 10             | ..     | ..                | 59        | 10 6              |  |
| 1      | 10 2              | 2      | 3 8               | 6      | 9 8               | 6      | 7 6               | 2      | 13 7              | 1      | 17 1              | 1      | 19 11             | ..     | ..                | 25        | 8 10              |  |
| ..     | ..                | ..     | ..                | 2      | 11 9              | 3      | 14 3              | ..     | ..                | 1      | 14 5              | ..     | ..                | ..     | ..                | 7         | 14 8              |  |
| 6      | 4 8               | 7      | 8 5               | 7      | 11 11             | 10     | 11 10             | 7      | 12 0              | 3      | 17 3              | ..     | ..                | ..     | ..                | 48        | 10 0              |  |
| ..     | ..                | ..     | ..                | 1      | 14 11             | 1      | 2 2               | 1      | 7 4               | ..     | ..                | ..     | ..                | ..     | ..                | 3         | 8 2               |  |
| 1      | 7 2               | ..     | ..                | ..     | ..                | 1      | 17 10             | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 2         | 12 6              |  |
| 1      | 11 3              | 1      | 12 8              | ..     | ..                | 1      | 15 6              | 1      | 20 4              | ..     | ..                | ..     | ..                | ..     | ..                | 8         | 10 7              |  |
| 1      | 11 6              | 2      | 7 11              | 1      | 4 11              | 2      | 12 10             | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 8         | 9 4               |  |
| ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 10 1              | ..     | ..                | ..     | ..                | ..     | ..                | 1         | 10 1              |  |
| ..     | ..                | ..     | ..                | ..     | ..                | 1      | 12 2              | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1         | 12 2              |  |
| 1      | 14 5              | 3      | 9 6               | 2      | 6 0               | 5      | 11 3              | 6      | 10 5              | 2      | 10 11             | ..     | ..                | ..     | ..                | 20        | 9 9               |  |
| 1      | 17 3              | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 3         | 10 6              |  |
| 3      | 6 6               | 2      | 16 0              | 1      | 10 0              | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 8         | 6 8               |  |
| 1      | 15 3              | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1      | 14 1              | ..     | ..                | ..     | ..                | 2         | 14 8              |  |
| ..     | ..                | ..     | ..                | ..     | ..                | 1      | 19 7              | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1         | 19 7              |  |
| 1      | 9 5               | 1      | 7 2               | ..     | ..                | ..     | ..                | 1      | 9 3               | ..     | ..                | ..     | ..                | ..     | ..                | 4         | 7 4               |  |
| ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 1         | 9 4               |  |
| ..     | ..                | ..     | ..                | 1      | 10 3              | 1      | 18 9              | ..     | ..                | ..     | ..                | ..     | ..                | ..     | ..                | 2         | 14 6              |  |
| ..     | ..                | ..     | ..                | 1      | 15 2              | ..     | ..                | 1      | 6 2               | ..     | ..                | ..     | ..                | ..     | ..                | 2         | 10 8              |  |
| 11     | 8 11              | 16     | 10 5              | 15     | 9 7               | 9      | 13 3              | 4      | 10 9              | ..     | ..                | ..     | ..                | ..     | ..                | 82        | 8 7               |  |
| 1      | 5 7               | 4      | 6 8               | 2      | 6 4               | ..     | ..                | 1      | 7 8               | ..     | ..                | ..     | ..                | ..     | ..                | 8         | 6 7               |  |

greater weight is thereby given to the unexpected principles disclosed, and should lead those connected with the management of life offices to the serious consideration of the financial questions which so obviously arise out of the results. From the relatively high rate of mortality at the more advanced ages, than at the younger ages, among assured lives, compared with those of the community generally, an opinion almost universally prevails, that there must be a loss, instead of a profit, connected with the transactions on old lives, and in consequence a number of life offices will not assure the lives of old persons. But if the ratio of lapsed policies, as set forth in Table XV,—and the ratio is much higher in this country,—be viewed in connection with the most remarkable law disclosed in Abstract C and Table XIII, there can no longer be any doubt that the general opinion is a most fallacious one, and unfortunately prevails to the serious detriment of the older class of lives, to whom, in pecuniary transactions, the principles of life assurance



are more strictly applicable than any other. Apart from statistical evidence, it must be sufficiently obvious, on an attentive consideration of the doctrine of probabilities, that in guaranteeing any event connected with the law of averages, the nearer to unity the chances of the contingency taking place be, the less the hazard of any adventure on the result. And if to this general principle be added the incidental pecuniary advantages arising from the moral influences and considerations which bear on the prosperity of a life office, the absurdity of the prejudice which prevails against assuring old lives must immediately appear. The following shews the results for six of the principal classes of disease:—

#### ABSTRACT K.

*Average Period elapsed from the Date of Assuring to the Date of Death, among Persons Dying at the following Ages.—Gotha Life Office.*

| DISEASE.                                                                       | 25 to 29. |         | 30 to 34. |         | 35 to 39. |         | 40 to 44. |         | 45 to 49. |         | 50 to 54. |         | 55 to 59. |         | 60 to 64. |         | 65 to 69. |         | 70 to 74. |         | 75 to 79. |         | All Ages. |         |
|--------------------------------------------------------------------------------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|
|                                                                                | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. | Years.    | Months. |
| All Diseases . . . . .                                                         | 3         | 2       | 3         | 6       | 5         | 2       | 6         | 8       | 8         | 2       | 8         | 10      | 9         | 8       | 10        | 10      | 12        | 4       | 14        | 9       | 16        | 6       | 9         | 1       |
| I. Zymotic Diseases . . . . .                                                  | 2         | 5       | 2         | 11      | 5         | 5       | 7         | 2       | 7         | 7       | 8         | 9       | 8         | 8       | 10        | 1       | 12        | 3       | 13        | 5       | 16        | 1       | 8         | 4       |
| II. Dropsy, Cancer, and other Diseases of uncertain or variable seat . . . . . | 2         | 9       | 3         | 2       | 4         | 10      | 7         | 7       | 8         | 10      | 8         | 10      | 9         | 2       | 8         | 9       | 13        | ..      | 15        | ..      | 15        | 7       | 9         | 6       |
| III. Tubercular Diseases . . . . .                                             | 4         | ..      | 4         | 1       | 5         | 2       | 4         | 8       | 8         | 9       | 9         | 6       | 11        | 4       | 11        | 7       | 12        | ..      | 13        | 7       | ..        | ..      | 8         | ..      |
| IV. Diseases of the Spinal Marrow, Nerves, and Senses . . . . .                | 2         | 10      | 3         | 3       | 4         | 6       | 7         | 7       | 8         | 2       | 9         | 2       | 9         | 6       | 11        | 8       | 12        | 4       | 14        | 7       | 17        | 2       | 9         | 2       |
| VI. Diseases of the Lungs and of the other Organs of Respiration . . . . .     | 2         | 8       | 3         | 8       | 4         | 10      | 6         | 7       | 6         | 5       | 6         | ..      | 11        | 2       | 11        | 2       | 11        | 11      | 12        | 11      | 15        | 11      | 8         | 7       |
| VII. Diseases of the Stomach, Liver, and other Organs of Respiration . . . . . | 2         | 3       | 3         | 9       | 5         | 8       | 7         | 8       | 6         | 11      | 9         | 8       | 10        | 9       | 10        | 3       | 12        | 4       | 15        | 8       | 17        | 10      | 9         | 1       |

Of the diseases in class I, namely, the zymotic diseases, it will be seen that the duration of the assurances on the lives falling by this class of disease, is less at every age than the average from all causes, except at the term of life 35–44; and it will likewise be seen, that for all ages taken collectively, the duration of the policies lapsing from these diseases is less than the average duration of all policies.

The same observation does not apply to class II. Under age 40, the duration of the policies is less than the average; but in the term of life 40–54, greater; the succeeding ten years again less; and in the term 65–74, greater; but for all ages collectively, the duration of policies becoming claims on account of death from this group of diseases, is five months' greater than the average.

In group III, which includes the tubercular diseases, it will be seen, that for all ages under 60, with the exception of the quinquennial term, 40–44, the period elapsed from the date of assuring to the date of death is above the average of the period connected with the deaths from all causes; shewing that, for those ages, the deaths of this class, which consists chiefly of phthisis, must be induced by a disease slow in its operation, and in that respect differing from the characteristic of group I. In respect to one term of life, 40–44, the deaths taking place therein, from this group of diseases, have followed very rapidly on the date of the lives being assured, and so remarkably so, as to reduce the average, at all ages collectively, from this disease, more than one year below the average from all causes. At the term of life 40–44, the period elapsed in the deaths from



all causes is 6 years 8 months, but in the group of tubercular diseases, it is only 4 years 8 months; and this would appear to be a true feature of the disease, for the greatest number of deaths have taken place at this term of life; at the other terms of life, when the opposite feature prevails, up to age 60, the result is constantly above the average. On referring to the details of group III, it will be found that these peculiar results are due wholly to the deaths from phthisis, and therefore the preceding observations are strictly applicable to that disease only.

Group IV contains the diseases of the nervous system, and it will be seen that the results do not differ widely from those for all causes; and the same remark applies to the deaths from apoplexy, which form a large proportion of this section.

On referring to group VI, which represents the other diseases of the lungs and of the organs of respiration, it will be seen that, with the exception of the decennial term of life, 55-64, the deaths take place in a shorter time after the date of assuring than in the average of the deaths from all causes, and in the aggregate of all the ages, the difference is six months. These results are due chiefly to the deaths from pneumonia, which constitute 229 out of the 251 deaths of this group. And it will further be seen, that the deaths from asthma have taken place at a period prolonged beyond the average.

In regard to the diseases enumerated in group VII, it will be found that, on the average, they agree in their results with the deaths from all causes; and that in the different quinquennial terms of life, the results are in some instances above, and in others below, the average.

If attention be now directed to the rate of mortality from the various specified causes given in Table XIII, it will be found that, for all ages taken collectively, the greatest mortality has resulted from zymotic diseases, or those forming group I; and next, tubercular diseases, or group III, which are here separated from the other diseases of the lungs and organs of respiration, which form a distinct class in group VI. The following Table is an abstract of the results in Table XIII, so far as concerns the rate of mortality; and it will be observed that the rate of mortality from the zymotic diseases does not differ widely between ages 31-50; but from that age upwards, a rapid and uniform rate of increase takes place:—In group II, including dropsy, cancer, &c., there is a uniform rate of increase from the younger to the older ages. In the class of tubercular diseases, there is not much difference in the rate of mortality between ages 31-50; but in the next three quinquennial terms of life, there is a gradual increase. In group IV, there will be observed a very great difference between the rate of mortality at the younger and more advanced ages; of the 375 deaths in this group, 274 consist of deaths from apoplexy, and the results are therefore conformable to those already described in connection with Table XI, preceding. The results of group VI resemble in their relation those in connection with group III. Group VII, it will be observed, resembles the results of group IV, in having a very low rate of mortality at the earlier ages, and increasing rapidly at the more advanced terms of life.



TABLE XIV, deduced from TABLE XIII.

| Age.       | Number of Persons Assured. | All Causes. |                     | I.<br>Zymotic Diseases. |                     | II.<br>Dropsy, Cancer, and other Diseases of uncertain seat. |                     | III.<br>Tubercular Diseases. |                     | IV.<br>Diseases of Brain, Spinal Marrow, Nerves, and Senses. |                     |
|------------|----------------------------|-------------|---------------------|-------------------------|---------------------|--------------------------------------------------------------|---------------------|------------------------------|---------------------|--------------------------------------------------------------|---------------------|
|            |                            | Deaths.     | Mortality per Cent. | Deaths.                 | Mortality per Cent. | Deaths.                                                      | Mortality per Cent. | Deaths.                      | Mortality per Cent. | Deaths.                                                      | Mortality per Cent. |
| 15 to 25   | 1,233                      | 4           | ·324                | 1                       | ·081                | ..                                                           | ..                  | 1                            | ·081                | ..                                                           | ..                  |
| 26 .. 30   | 5,595                      | 37          | ·661                | 10                      | ·179                | 2                                                            | ·036                | 9                            | ·161                | 6                                                            | ·107                |
| 31 .. 35   | 13,136                     | 113         | ·860                | 38                      | ·289                | 9                                                            | ·069                | 38                           | ·289                | 5                                                            | ·038                |
| 36 .. 40   | 20,734                     | 217         | 1·047               | 60                      | ·289                | 18                                                           | ·087                | 54                           | ·260                | 22                                                           | ·106                |
| 41 .. 45   | 24,503                     | 278         | 1·135               | 64                      | ·261                | 38                                                           | ·155                | 74                           | ·303                | 29                                                           | ·118                |
| 46 .. 50   | 22,507                     | 313         | 1·394               | 67                      | ·298                | 49                                                           | ·218                | 66                           | ·293                | 45                                                           | ·200                |
| 51 .. 55   | 18,025                     | 334         | 1·853               | 64                      | ·355                | 46                                                           | ·255                | 67                           | ·372                | 58                                                           | ·322                |
| 56 .. 60   | 13,035                     | 363         | 2·785               | 66                      | ·506                | 66                                                           | ·506                | 54                           | ·414                | 63                                                           | ·483                |
| 61 .. 65   | 8,324                      | 355         | 4·265               | 59                      | ·709                | 72                                                           | ·865                | 49                           | ·589                | 62                                                           | ·745                |
| 66 .. 70   | 4,058                      | 271         | 6·678               | 43                      | 1·060               | 47                                                           | 1·158               | 20                           | ·493                | 53                                                           | 1·306               |
| 71 .. 80   | 1,719                      | 181         | 10·529              | 29                      | 1·687               | 33                                                           | 1·920               | 5                            | ·291                | 32                                                           | 1·862               |
| All Ages.. | 132,869                    | 2,466       | 1·856               | 501                     | ·377                | 380                                                          | ·286                | 437                          | ·329                | 375                                                          | ·282                |

| Age.       | Number of Persons Assured. | V.<br>Diseases of the Heart and Blood Vessels. |                     | VI.<br>Diseases of the Lungs and Organs of Respiration. |                     | VII.<br>Diseases of the Stomach, Liver and other Organs of Digestion. |                     | VIII.<br>Diseases of the Kidneys, &c. |                     | IX.<br>Childbirth, Diseases of the Uterus, &c. |                     |
|------------|----------------------------|------------------------------------------------|---------------------|---------------------------------------------------------|---------------------|-----------------------------------------------------------------------|---------------------|---------------------------------------|---------------------|------------------------------------------------|---------------------|
|            |                            | Deaths.                                        | Mortality per Cent. | Deaths.                                                 | Mortality per Cent. | Deaths.                                                               | Mortality per Cent. | Deaths.                               | Mortality per Cent. | Deaths.                                        | Mortality per Cent. |
| 15 to 25   | 1,233                      | ..                                             | ..                  | 2                                                       | ·162                | ..                                                                    | ..                  | ..                                    | ..                  | ..                                             | ..                  |
| 26 .. 30   | 5,595                      | 1                                              | ·018                | 4                                                       | ·071                | 1                                                                     | ·018                | ..                                    | ..                  | ..                                             | ..                  |
| 31 .. 35   | 13,136                     | 1                                              | ·008                | 9                                                       | ·069                | 3                                                                     | ·023                | ..                                    | ..                  | 3                                              | ·023                |
| 36 .. 40   | 20,734                     | 7                                              | ·034                | 26                                                      | ·125                | 14                                                                    | ·068                | 5                                     | ·024                | ..                                             | ..                  |
| 41 .. 45   | 24,503                     | 6                                              | ·024                | 29                                                      | ·118                | 25                                                                    | ·102                | 2                                     | ·008                | ..                                             | ..                  |
| 46 .. 50   | 22,507                     | 11                                             | ·049                | 28                                                      | ·124                | 20                                                                    | ·089                | 4                                     | ·018                | 5                                              | 0·22                |
| 51 .. 55   | 18,025                     | 10                                             | ·056                | 33                                                      | ·183                | 26                                                                    | ·144                | 6                                     | ·033                | 1                                              | ·006                |
| 56 .. 60   | 13,035                     | 19                                             | ·146                | 34                                                      | ·261                | 37                                                                    | ·283                | 3                                     | ·023                | ..                                             | ..                  |
| 61 .. 65   | 8,324                      | 12                                             | ·144                | 32                                                      | ·384                | 41                                                                    | ·493                | 10                                    | ·120                | 1                                              | ·012                |
| 66 .. 70   | 4,058                      | 2                                              | ·049                | 39                                                      | ·961                | 25                                                                    | ·616                | 8                                     | ·197                | ..                                             | ..                  |
| 71 .. 80   | 1,719                      | ..                                             | ..                  | 15                                                      | ·873                | 15                                                                    | ·873                | 2                                     | ·116                | ..                                             | ..                  |
| All Ages.. | 132,869                    | 69                                             | ·052                | 251                                                     | ·189                | 207                                                                   | ·156                | 40                                    | ·030                | 10                                             | ·008                |

| Age.       | Number of Persons Assured. | X.<br>Rheumatism, Diseases of the Bones, &c. |                     | XI.<br>Diseases of the Skin, Cellular Tissue, &c. |                     | XIII.<br>Debility. |                     | XV.<br>Old Age. |                     | XVII.<br>Violence, Privation, Cold & Intemperance. |                     |
|------------|----------------------------|----------------------------------------------|---------------------|---------------------------------------------------|---------------------|--------------------|---------------------|-----------------|---------------------|----------------------------------------------------|---------------------|
|            |                            | Deaths.                                      | Mortality per Cent. | Deaths.                                           | Mortality per Cent. | Deaths.            | Mortality per Cent. | Deaths.         | Mortality per Cent. | Deaths.                                            | Mortality per Cent. |
| 15 to 25   | 1,233                      | ..                                           | ..                  | ..                                                | ..                  | ..                 | ..                  | ..              | ..                  | ..                                                 | ..                  |
| 26 .. 30   | 5,595                      | 1                                            | ·018                | 1                                                 | ·018                | ..                 | ..                  | ..              | ..                  | 2                                                  | ·036                |
| 31 .. 35   | 13,136                     | ..                                           | ..                  | ..                                                | ..                  | ..                 | ..                  | ..              | ..                  | 7                                                  | ·053                |
| 36 .. 40   | 20,734                     | 2                                            | ·010                | ..                                                | ..                  | ..                 | ..                  | ..              | ..                  | 9                                                  | ·044                |
| 41 .. 45   | 24,503                     | 1                                            | ·004                | ..                                                | ..                  | ..                 | ..                  | ..              | ..                  | 10                                                 | ·041                |
| 46 .. 50   | 22,507                     | 5                                            | ·022                | 1                                                 | ·004                | ..                 | ..                  | ..              | ..                  | 11                                                 | ·049                |
| 51 .. 55   | 18,025                     | 2                                            | ·010                | 1                                                 | ·006                | ..                 | ..                  | ..              | ..                  | 16                                                 | ·089                |
| 56 .. 60   | 13,035                     | 1                                            | ·008                | ..                                                | ..                  | 1                  | ·008                | ..              | ..                  | 17                                                 | ·130                |
| 61 .. 65   | 8,324                      | 1                                            | ·012                | 1                                                 | ·012                | ..                 | ..                  | 6               | ·070                | 10                                                 | ·120                |
| 66 .. 70   | 4,058                      | ..                                           | ..                  | 1                                                 | ·025                | 3                  | ·074                | 24              | ·591                | 5                                                  | ·123                |
| 71 .. 80   | 1,719                      | ..                                           | ..                  | ..                                                | ..                  | ..                 | ..                  | 49              | 2·850               | ..                                                 | ..                  |
| All Ages.. | 132,869                    | 13                                           | ·010                | 5                                                 | ·004                | 4                  | ·003                | 79              | ·059                | 87                                                 | ·065                |



The preceding remarks have been made on six only of the principal groups of diseases, and the following still more condensed Abstract of the results may be interesting. The Roman numerals represent the diseases as grouped in the preceding Table and in Table XIII.

*Diseases arranged according to the order of their Intensity at the following Ages.*

| 31—35.       | 36—40.    | 41—45.      | 46—50.    | 51—55.    | 56—60.      | 61—65.    | 66—70.     | 71—80.       |
|--------------|-----------|-------------|-----------|-----------|-------------|-----------|------------|--------------|
| I }<br>III } | I<br>III  | III<br>I    | I<br>III  | III<br>I  | I }<br>II } | II<br>IV  | IV<br>II   | II<br>IV     |
| II }<br>VI } | VI<br>IV  | II<br>IV }  | II<br>IV  | IV<br>II  | IV<br>III   | I<br>III  | I<br>VI    | I<br>VI }    |
| IV<br>VII    | II<br>VII | VI }<br>VII | VI<br>VII | VI<br>VII | VII<br>VI   | VII<br>VI | VII<br>III | VII }<br>III |

In the above, as in Table XI, it will be seen that, at the earlier ages, the intensity of the zymotic diseases, and also tubercular disease, is greatest; but at the more advanced, a gradual falling off will be observable in the class of tubercular disease. In the term of life 56–65, tubercular disease stands fourth in the order of intensity, and in the term 66–80, last in order. Again, with respect to class IV, which consists, to a great extent, of deaths from apoplexy, it will be observed that, in the period of life 36–50, it stands fourth in the order of intensity; but that in each of the three succeeding quinquennial terms of life it gradually advances one step in the order of intensity, until, at the term 66–70, it is highest in intensity. This assimilates strictly with the results at pp. 170, 171 preceding. The class of pulmonary diseases, however, or diseases of the respiratory organs, not only in Table XI, but in the Abstracts given in pages 169 and 171, as well as in the earlier Reports of the Registrar-General, included group III, and also group VI; and if the results be viewed in accordance with this arrangement, the diseases of the respiratory organs will be found to take precedence of all others between ages 31–70, and in the term of life 70–80, they will stand fourth in order.

With the view to shew the relative intensity of the various groups of disease at different terms of life amongst different populations, the following Abstracts, deduced from facts presented in the Reports of the Registrar-General, are given:—



## MORTALITY OF THE PROVIDENT CLASSES

## ABSTRACT L.

*Mortality of Kent.—Males.*

| Age.         | CAUSES OF DEATH.     |                        |                         |                        |                                                      |                        |                                               |                        |
|--------------|----------------------|------------------------|-------------------------|------------------------|------------------------------------------------------|------------------------|-----------------------------------------------|------------------------|
|              | All Causes.          |                        | I.<br>Zymotic Diseases. |                        | II.<br>Diseases<br>of uncertain or<br>variable seat. |                        | III.<br>Diseases<br>of the<br>Nervous System. |                        |
|              | Number of<br>Deaths. | Mortality<br>per Cent. | Number of<br>Deaths.    | Mortality<br>per Cent. | Number of<br>Deaths.                                 | Mortality<br>per Cent. | Number of<br>Deaths.                          | Mortality<br>per Cent. |
| 15 to 19     | 185                  | ·797                   | 33                      | ·142                   | 18                                                   | ·078                   | 14                                            | ·060                   |
| 20 ... 24    | 250                  | 1·165                  | 50                      | ·233                   | 12                                                   | ·056                   | 14                                            | ·065                   |
| 25 ... 29    | 198                  | 1·196                  | 32                      | ·193                   | 12                                                   | ·072                   | 11                                            | ·066                   |
| 30 ... 34    | 183                  | 1·156                  | 31                      | ·156                   | 13                                                   | ·082                   | 22                                            | ·139                   |
| 35 ... 39    | 171                  | 1·368                  | 15                      | ·119                   | 17                                                   | ·135                   | 18                                            | ·143                   |
| 40 ... 44    | 174                  | 1·373                  | 26                      | ·205                   | 17                                                   | ·134                   | 32                                            | ·253                   |
| 45 ... 49    | 147                  | 1·571                  | 12                      | ·128                   | 23                                                   | ·246                   | 23                                            | ·246                   |
| 50 ... 54    | 178                  | 1·845                  | 24                      | ·256                   | 19                                                   | ·202                   | 22                                            | ·234                   |
| 55 ... 59    | 148                  | 2·461                  | 12                      | ·200                   | 29                                                   | ·482                   | 24                                            | ·408                   |
| 60 ... 64    | 220                  | 3·393                  | 20                      | ·308                   | 44                                                   | ·679                   | 33                                            | ·509                   |
| 65 ... 69    | 231                  | 5·558                  | 22                      | ·529                   | 33                                                   | ·794                   | 44                                            | 1·059                  |
| 70 ... 74    | 293                  | 8·386                  | 18                      | ·515                   | 46                                                   | ·831                   | 54                                            | 1·546                  |
| 75 ... 79    | 228                  | 11·820                 | 18                      | ·933                   | 28                                                   | 1·452                  | 26                                            | 1·348                  |
| All Ages ... | 2,607                | 1·821                  | 313                     | ·219                   | 311                                                  | ·217                   | 337                                           | ·235                   |

| Age.         | CAUSES OF DEATH.                                 |                        |                                                    |                        |                                                |                        |                                               |                        |
|--------------|--------------------------------------------------|------------------------|----------------------------------------------------|------------------------|------------------------------------------------|------------------------|-----------------------------------------------|------------------------|
|              | IV.<br>Diseases<br>of the Respiratory<br>Organs. |                        | V.<br>Diseases<br>of the Organs of<br>Circulation. |                        | VI.<br>Diseases<br>of the<br>Digestive Organs. |                        | VII.<br>Diseases<br>of the<br>Urinary Organs. |                        |
|              | Number of<br>Deaths.                             | Mortality<br>per Cent. | Number of<br>Deaths.                               | Mortality<br>per Cent. | Number of<br>Deaths.                           | Mortality<br>per Cent. | Number of<br>Deaths.                          | Mortality<br>per Cent. |
| 15 to 19     | 72                                               | ·310                   | 7                                                  | ·030                   | 7                                              | ·030                   | 1                                             | ·004                   |
| 20 ... 24    | 125                                              | ·583                   | 5                                                  | ·023                   | 12                                             | ·056                   | 2                                             | ·009                   |
| 25 ... 29    | 109                                              | ·658                   | 5                                                  | ·030                   | 12                                             | ·072                   | ...                                           | ...                    |
| 30 ... 34    | 90                                               | ·568                   | 7                                                  | ·044                   | 4                                              | ·025                   | 2                                             | ·013                   |
| 35 ... 39    | 75                                               | ·597                   | 9                                                  | ·072                   | 13                                             | ·103                   | 4                                             | ·032                   |
| 40 ... 44    | 60                                               | ·474                   | 9                                                  | ·071                   | 10                                             | ·079                   | 3                                             | ·024                   |
| 45 ... 49    | 53                                               | ·566                   | 6                                                  | ·064                   | 13                                             | ·139                   | 2                                             | ·021                   |
| 50 ... 54    | 75                                               | ·798                   | 9                                                  | ·096                   | 16                                             | ·170                   | 4                                             | ·042                   |
| 55 ... 59    | 46                                               | ·765                   | 13                                                 | ·216                   | 17                                             | ·283                   | 3                                             | ·050                   |
| 60 ... 64    | 51                                               | ·781                   | 18                                                 | ·278                   | 16                                             | ·247                   | 5                                             | ·077                   |
| 65 ... 69    | 44                                               | 1·059                  | 17                                                 | ·409                   | 24                                             | ·577                   | 8                                             | ·193                   |
| 70 ... 74    | 44                                               | 1·259                  | 17                                                 | ·486                   | 18                                             | ·515                   | 12                                            | ·343                   |
| 75 ... 79    | 25                                               | 1·296                  | 4                                                  | ·207                   | 8                                              | ·415                   | 7                                             | ·363                   |
| All Ages ... | 869                                              | ·607                   | 126                                                | ·088                   | 170                                            | ·119                   | 53                                            | ·037                   |



## ABSTRACT L.—(continued).

| Age.        | CAUSES OF DEATH.                                     |                        |                                                    |                        |                                                   |                        |                      |                        |                                                               |                        |
|-------------|------------------------------------------------------|------------------------|----------------------------------------------------|------------------------|---------------------------------------------------|------------------------|----------------------|------------------------|---------------------------------------------------------------|------------------------|
|             | VIII.<br>Diseases<br>of the Organs of<br>Generation. |                        | IX.<br>Diseases<br>of the Organs of<br>Locomotion. |                        | X.<br>Diseases<br>of the Integumentary<br>System. |                        | XI.<br>Old Age.      |                        | XII.<br>External Causes,<br>Poisoning, Asphyxia,<br>Injuries. |                        |
|             | Number of<br>Deaths.                                 | Mortality<br>per Cent. | Number of<br>Deaths.                               | Mortality<br>per Cent. | Number of<br>Deaths.                              | Mortality<br>per Cent. | Number of<br>Deaths. | Mortality<br>per Cent. | Number of<br>Deaths.                                          | Mortality<br>per Cent. |
| 15 to 19    | ...                                                  | ...                    | 6                                                  | ·026                   | 1                                                 | ·004                   | ...                  | ...                    | 26                                                            | ·112                   |
| 20 ... 24   | ...                                                  | ...                    | 7                                                  | ·033                   | 3                                                 | ·014                   | ...                  | ...                    | 20                                                            | ·093                   |
| 25 ... 29   | ...                                                  | ...                    | 2                                                  | ·012                   | ...                                               | ...                    | ...                  | ...                    | 15                                                            | ·091                   |
| 30 ... 34   | ...                                                  | ...                    | 1                                                  | ·006                   | ...                                               | ...                    | ...                  | ...                    | 13                                                            | ·082                   |
| 35 ... 39   | ...                                                  | ...                    | 2                                                  | ·016                   | 2                                                 | ·016                   | ...                  | ...                    | 17                                                            | ·135                   |
| 40 ... 44   | ...                                                  | ...                    | 2                                                  | ·016                   | ...                                               | ...                    | ...                  | ...                    | 15                                                            | ·118                   |
| 45 ... 49   | ...                                                  | ...                    | 3                                                  | ·032                   | ...                                               | ...                    | ...                  | ...                    | 12                                                            | ·128                   |
| 50 ... 54   | ...                                                  | ...                    | 2                                                  | ·021                   | ...                                               | ...                    | ...                  | ...                    | 7                                                             | ·075                   |
| 55 ... 59   | ...                                                  | ...                    | 1                                                  | ·017                   | ...                                               | ...                    | ...                  | ...                    | 3                                                             | ·050                   |
| 60 ... 64   | 1                                                    | ·015                   | 2                                                  | ·031                   | 1                                                 | ·015                   | 20                   | ·308                   | 9                                                             | ·139                   |
| 65 ... 69   | 1                                                    | ·024                   | ...                                                | ...                    | 2                                                 | ·048                   | 31                   | ·312                   | 5                                                             | ·151                   |
| 70 ... 74   | 2                                                    | ·057                   | 1                                                  | ·029                   | 1                                                 | ·029                   | 77                   | 2·204                  | 3                                                             | ·086                   |
| 75 ... 79   | 1                                                    | ·052                   | 1                                                  | ·052                   | 1                                                 | ·052                   | 106                  | 5·495                  | 3                                                             | ·156                   |
| All Ages... | 5                                                    | ·003                   | 30                                                 | ·021                   | 11                                                | ·008                   | 234                  | ·163                   | 148                                                           | ·010                   |

## ABSTRACT M.

*Twenty-four Town Districts of England.—Males.*

| Age.      | Male<br>Population. | All Causes. |                        | Zymotic, Endemic,<br>and<br>Contagious Diseases. |                        | Diseases of<br>Uncertain or Variable<br>seat. |                        | Diseases<br>of the<br>Nervous System. |                        |
|-----------|---------------------|-------------|------------------------|--------------------------------------------------|------------------------|-----------------------------------------------|------------------------|---------------------------------------|------------------------|
|           |                     | Deaths.     | Mortality<br>per Cent. | Deaths.                                          | Mortality<br>per Cent. | Deaths.                                       | Mortality<br>per Cent. | Deaths.                               | Mortality<br>per Cent. |
| 15 to 20  | 83,707              | 758         | ·906                   | 138                                              | ·165                   | 61                                            | ·073                   | 40                                    | ·048                   |
| 20 ... 30 | 161,585             | 1,756       | 1·087                  | 270                                              | ·167                   | 112                                           | ·069                   | 71                                    | ·044                   |
| 30 ... 40 | 123,104             | 1,804       | 1·465                  | 225                                              | ·183                   | 159                                           | ·129                   | 132                                   | ·107                   |
| 40 ... 50 | 83,442              | 1,786       | 2·140                  | 216                                              | ·259                   | 202                                           | ·242                   | 148                                   | ·177                   |
| 50 ... 60 | 47,648              | 1,526       | 3·203                  | 121                                              | ·254                   | 213                                           | ·447                   | 162                                   | ·340                   |
| 60 ... 70 | 27,577              | 1,598       | 5·795                  | 100                                              | ·363                   | 221                                           | ·801                   | 189                                   | ·685                   |
| 70 ... 80 | 10,555              | 1,291       | 12·231                 | 50                                               | ·474                   | 123                                           | 1·165                  | 110                                   | 1·042                  |
|           | 537,618             | 10,519      | 1·957                  | 1,120                                            | ·208                   | 1,091                                         | ·203                   | 852                                   | ·158                   |

| Age.      | Male<br>Population. | Diseases<br>of the<br>Respiratory Organs. |                        | Diseases<br>of the<br>Organs of Circulation. |                        | Diseases<br>of the<br>Digestive Organs. |                        | Diseases<br>of the<br>Urinary Organs. |                        |
|-----------|---------------------|-------------------------------------------|------------------------|----------------------------------------------|------------------------|-----------------------------------------|------------------------|---------------------------------------|------------------------|
|           |                     | Deaths.                                   | Mortality<br>per Cent. | Deaths.                                      | Mortality<br>per Cent. | Deaths.                                 | Mortality<br>per Cent. | Deaths.                               | Mortality<br>per Cent. |
| 15 to 20  | 83,707              | 322                                       | ·385                   | 24                                           | ·029                   | 37                                      | ·044                   | 1                                     | ·001                   |
| 20 ... 30 | 161,585             | 957                                       | ·592                   | 39                                           | ·024                   | 63                                      | ·039                   | 11                                    | ·068                   |
| 30 ... 40 | 123,104             | 897                                       | ·729                   | 49                                           | ·040                   | 103                                     | ·084                   | 16                                    | ·013                   |
| 40 ... 50 | 83,442              | 825                                       | ·989                   | 60                                           | ·072                   | 119                                     | ·143                   | 22                                    | ·026                   |
| 50 ... 60 | 47,648              | 654                                       | 1·373                  | 61                                           | ·128                   | 121                                     | ·254                   | 19                                    | ·010                   |
| 60 ... 70 | 27,577              | 545                                       | 1·976                  | 63                                           | ·228                   | 105                                     | ·381                   | 29                                    | ·105                   |
| 70 ... 80 | 10,555              | 225                                       | 2·132                  | 20                                           | ·189                   | 48                                      | ·455                   | 31                                    | ·294                   |
|           | 537,618             | 4,425                                     | ·823                   | 316                                          | ·059                   | 596                                     | ·111                   | 129                                   | ·024                   |



## ABSTRACT M.—(continued.)

| Age.      | Male Population. | Diseases of the Organs of Generation. |                     | Diseases of the Organs of Locomotion. |                     | Diseases of the Integumentary System. |                     | Old Age. |                     | External Causes, Poisoning, Asphyxia, Injuries. |                     |
|-----------|------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|---------------------------------------|---------------------|----------|---------------------|-------------------------------------------------|---------------------|
|           |                  | Deaths.                               | Mortality per Cent. | Deaths.                               | Mortality per Cent. | Deaths.                               | Mortality per Cent. | Deaths.  | Mortality per Cent. | Deaths.                                         | Mortality per Cent. |
| 15 ... 20 | 83,707           | ...                                   | ...                 | 14                                    | ·017                | 2                                     | ·002                | ...      | ...                 | 111                                             | ·133                |
| 20 ... 30 | 161,585          | 1                                     | ·001                | 20                                    | ·012                | ...                                   | ...                 | ...      | ...                 | 195                                             | ·121                |
| 30 ... 40 | 123,104          | 2                                     | ·002                | 25                                    | ·020                | 8                                     | ·006                | ...      | ...                 | 180                                             | ·146                |
| 40 ... 50 | 83,442           | ...                                   | ...                 | 13                                    | ·016                | 9                                     | ·011                | ...      | ...                 | 153                                             | ·183                |
| 50 ... 60 | 47,648           | ...                                   | ...                 | 25                                    | ·052                | 6                                     | ·013                | 27       | ·057                | 97                                              | ·204                |
| 60 ... 70 | 27,577           | 1                                     | ·004                | 18                                    | ·065                | 10                                    | ·036                | 230      | ·834                | 61                                              | ·221                |
| 70 ... 80 | 10,555           | ...                                   | ...                 | 6                                     | ·057                | 3                                     | ·028                | 642      | 5·944               | 24                                              | ·227                |
|           | 537,618          | 4                                     | ·001                | 121                                   | ·023                | 38                                    | ·007                | 899      | ·017                | 821                                             | ·015                |

## ABSTRACT N.

*Mortality of the Metropolis.—Males.*

| CAUSES OF DEATH.                                                    | Ages.               |        |        |        |        |        |        |       |
|---------------------------------------------------------------------|---------------------|--------|--------|--------|--------|--------|--------|-------|
|                                                                     | 15—19.              | 20—29. | 30—39. | 40—49. | 50—59. | 60—69. | 70—79. | All.  |
|                                                                     | Mortality per Cent. |        |        |        |        |        |        |       |
| All Causes . . . . .                                                | ·161                | ·900   | 1·301  | 1·967  | 3·105  | 4·850  | 7·448  | 2·004 |
| I. Zymotic Diseases . . . . .                                       | ·023                | ·095   | ·089   | ·119   | ·171   | ·177   | ·380   | ·131  |
| SPORADIC DISEASES.                                                  |                     |        |        |        |        |        |        |       |
| II. Of uncertain, or variable seat . .                              | ·015                | ·067   | ·163   | ·270   | ·537   | ·818   | 1·258  | ·293  |
| III. Of the Nervous System . . . .                                  | ·008                | ·045   | ·120   | ·237   | ·039   | ·600   | ·892   | ·215  |
| IV. Of the Respiratory Organs . . .                                 | ·072                | ·543   | ·689   | ·962   | 1·357  | 1·589  | 1·268  | ·809  |
| V. Of the Organs of Circulation . .                                 | ·004                | ·031   | ·062   | ·085   | ·138   | ·253   | ·195   | ·082  |
| VI. Of the Digestive Organs . . . .                                 | ·011                | ·032   | ·059   | ·118   | ·234   | ·319   | ·224   | ·112  |
| VII. Of the Urinary Organs . . . .                                  | ·001                | ·006   | ·017   | ·039   | ·088   | ·170   | ·181   | ·045  |
| VIII. Of the Organs of Generation . .                               | ...                 | ...    | ...    | ...    | ...    | ...    | ·104   | 0·002 |
| IX. Of the Organs of Locomotion . .                                 | ·003                | ·010   | ·018   | ·014   | ·019   | ·038   | ·024   | ·017  |
| X. Of the Integumentary System . .                                  | ...                 | ·001   | ·001   | ·004   | ·005   | ·020   | ·020   | ·004  |
| XI. Old Age . . . . .                                               | ...                 | ...    | ...    | ...    | ·023   | ·704   | 2·847  | ·191  |
| XII. External causes — Poisoning, }<br>Asphyxia, Injuries . . . . } | ·025                | ·066   | ·083   | ·119   | ·145   | ·131   | ·156   | ·104  |

With respect to the results furnished in the preceding Abstracts, it may be sufficient to refer to those in connection with the term of life 41–50; and so far as concerns the group of zymotic diseases, it is obvious that the intensity of mortality is higher in the Gotha Life Office than in any of the other classes of facts brought forward; but in regard to group II, which includes dropsy, cancer, and diseases of uncertain seat,



the opposite result is observable, the mortality being less in the Gotha Life Office than in any of the other classes of facts now under observation ; but in respect to the diseases of the respiratory organs, the results for the same ages are very remarkable and important, being for the four different classes of facts, as follows, viz. :—

|                                 |                |
|---------------------------------|----------------|
| Gotha Life Office . . . . .     | ·419 per cent. |
| Division of East Kent . . . . . | ·520 ...       |
| Metropolis . . . . .            | ·962 ...       |
| Twenty-four Towns . . . . .     | ·989 ...       |

The immunity from this class of diseases in the Gotha Life Office, and also in the division of East Kent, is remarkable, when placed in contrast with the other figures. Similar remarks are applicable to the two other classes of diseases contained in the following condensed abstract of figures presented in the preceding Abstracts :—

| Group of Diseases, classified as in Table XIII. | Results per Cent.—Ages 41—50—for the different Classes of Disease in the |                        |             |                    |
|-------------------------------------------------|--------------------------------------------------------------------------|------------------------|-------------|--------------------|
|                                                 | Gotha Life Office.                                                       | Division of East Kent. | Metropolis. | Twenty-Four Towns. |
| I . . . . .                                     | ·279                                                                     | ·166                   | ·119        | ·259               |
| II . . . . .                                    | ·186                                                                     | ·190                   | ·270        | ·242               |
| III + VI . . . . .                              | ·419                                                                     | ·520                   | ·962        | ·989               |
| IV . . . . .                                    | ·159                                                                     | ·299                   | ·237        | ·177               |
| VII . . . . .                                   | ·095                                                                     | ·109                   | ·118        | ·143               |

The differences for other terms of life will be easily discovered from an examination of the various Abstracts.

With respect to the deaths which have taken place from Asiatic Cholera, it will be seen, from Abstract H, that 12 deaths took place from that cause in the ten years 1829–38, 17 in the ten years 1839–48, and 31 in the year 1849. In Table XI, it will be seen that, although the greatest number of deaths happened in the decennial term of life 41–50, still the highest rate of mortality from this disease was at ages 61–70 ; and if the results for the whole 21 years, as set forth in Table XIII, be considered in reference to age, it will be seen that the largest number of deaths have taken place between ages 51–60 ; but the rate of mortality has gone on increasing from the youngest to the oldest age, as will be seen by the following Abstract :—

| Age.       | Lives Exposed to Risk. | Deaths from Cholera. | Mortality per Cent. | Being One Death in |
|------------|------------------------|----------------------|---------------------|--------------------|
| 31 to 40   | 33,870                 | 7                    | ·021                | 4,762              |
| 41 ... 50  | 47,010                 | 15                   | ·032                | 3,125              |
| 51 ... 60  | 31,050                 | 18                   | ·058                | 1,724              |
| 61 ... 70  | 12,382                 | 17                   | ·137                | 730                |
| 71 ... 80  | 1,719                  | 3                    | ·175                | 571                |
| Total..... | 126,031                | 60                   | ·048                | 2,083              |



A similar law has always been observed elsewhere, although during epidemic periods the mortality must of course be greater than that shewn in the above Table. A few deaths took place at intervals throughout the whole period; but if the principal year of the epidemic be considered, namely, 1849, the rate of mortality will appear much increased:—

| Age.       | Lives Exposed to Risk. | Deaths from Cholera. | Mortality per Cent. | Being One Death in |
|------------|------------------------|----------------------|---------------------|--------------------|
| 31 to 40   | 3,565                  | 3                    | ·084                | 1,188              |
| 41 ... 50  | 5,766                  | 3                    | ·052                | 1,922              |
| 51 ... 60  | 3,060                  | 10                   | ·327                | 306                |
| 61 ... 70  | 1,653                  | 12                   | ·726                | 138                |
| 71 ... 80  | 341                    | 3                    | ·880                | 114                |
| Total..... | 14,385                 | 31                   | ·215                | 464                |

This will be found to be much under the rate of mortality from cholera in Paris and many other places during the year 1832, for all ages taken collectively; the result being one in 42·7 for Paris, but one in 464 in the Gotha Life Office, for ages 31–80. The influence of age is very remarkable in modifying the mortality from this disease. The following are the results for all ages in Paris, shewing the mortality from cholera from the 26th March to the 30th September, in the year 1832:—

| Age.       | Population. | Deaths from Cholera. | Mortality per Cent. | Being One in |
|------------|-------------|----------------------|---------------------|--------------|
| 0 to 5     | 53,124      | 1,311                | 2·468               | 41           |
| 5 ... 10   | 50,059      | 392                  | 783                 | 153          |
| 10 ... 15  | 54,696      | 202                  | 369                 | 271          |
| 15 ... 20  | 79,058      | 377                  | 477                 | 210          |
| 20 ... 25  | 82,044      | 959                  | 1·169               | 86           |
| 25 ... 30  | 75,836      | 1,206                | 1·590               | 63           |
| 30 ... 40  | 125,188     | 2,771                | 2·213               | 45           |
| 40 ... 50  | 97,526      | 3,727                | 2·796               | 36           |
| 50 ... 60  | 81,415      | 2,913                | 3·577               | 28           |
| 60 ... 70  | 58,625      | 3,121                | 5·324               | 19           |
| 70 ... 80  | 23,262      | 2,044                | 8·787               | 11           |
| 80 ... 90  | 4,715       | 365                  | 7·741               | 13           |
| 90 ... 100 | 314         | 14                   | 4·458               | 22           |
| Total..... | 785,862     | 18,402               | 2·342               | 42·7         |

The following is the rate of mortality from cholera, at corresponding ages, in the Gotha Life Office, Paris, and London:



| Age.     | Gotha Life Office, 1849. |        | Paris, 1832. |        | London, 1849. |        |
|----------|--------------------------|--------|--------------|--------|---------------|--------|
|          | Per Cent.                | One in | Per Cent.    | One in | Per Cent.     | One in |
| 31 to 40 | ·084                     | 1,186  | 2·213        | 45     | ·661          | 151    |
| 41 .. 50 | ·052                     | 1,922  | 2·796        | 36     | ·830          | 120    |
| 51 .. 60 | ·327                     | 306    | 3·577        | 28     | 1·243         | 80     |
| 61 .. 70 | ·726                     | 138    | 5·324        | 19     | 1·726         | 58     |
| 71 .. 80 | ·880                     | 114    | 8·787        | 11     | 2·182         | 46     |
| Total .. | ·215                     | 464    | 3·776        | 26     | ·962          | 104    |

Hence the mortality within the ages 31–80, is one in 464, while in Paris it was one in 26, and in London one in 104. The differences for each of the decennial periods of life are also shewn.

Abstract H, and Tables XI and XIII, will shew the mortality from violent causes. In the ten years, 1829–38, 11 deaths took place from suicide; in the twenty years, 1829–48, 64 deaths from the same cause; 39 of these deaths took place between ages 41–60. During the twenty-one years, 1829–49, 87 deaths took place from violent causes of all kinds, and an inspection of Section XVII of Table XIV, will shew the influence of age on the rate of mortality from these causes, and it will be found that with but slight irregularities, which appear to be due chiefly to small numbers, there is a gradual rate of increase from the younger to the older ages. In England and Wales, the deaths from violence, within the above ages, are one in 19; in the Equitable Life Office, one in 54; and in the Scottish Widows' Fund, one in 35; and in the Gotha Life Office, one in 28 of the total deaths, within the same term of life. This question will hereafter be more fully discussed.

Allusion has just been made to the mortality in the Scottish Widows' Fund and Life Assurance Society. In the "Monthly Journal of Medical Science" for January 1847, will be found a most interesting paper by James Begbie, M.D., Consulting Physician to the Society, on the Mortality of the Members. This is the only published document\* of any importance which gives the mortality from different causes amongst assured lives: the nosological arrangement of the return by the Equitable Society being so defective as to render the results of little or no practical value.

The facts brought under consideration by Dr. Begbie include the experience of the "Scottish Widows' Fund" for the years 1815–45, in which 642 deaths took place among 5989 persons, of whom 447 were females; but it is important to observe that all those persons whose policies were either surrendered or forfeited are not included in the preceding numbers, so that the full number of persons exposed to the risk of mortality in the

\* See also Table XX and Abstract S, which give the results of a further contribution by Dr. Begbie. Table XX likewise furnishes the general results of a similar investigation by Professor Christison.



Society, during the thirty-one years above referred to, is not given. There is another element of importance wanting in Dr. Begbie's paper. While the ages at death from different causes are furnished, the population for those ages, or the number of persons exposed to the risk of mortality at the corresponding terms of life is not given. It is greatly to be regretted that such is the case, for it deprives his paper of one of its most important uses. However, this defect might to some extent have been supplied from the distribution of ages in the Gotha Life Office, which cannot differ in any very marked manner from those in the Scottish Widows' Fund, had the gross numbers exposed to the risk of mortality also been given, and the surrendered and forfeited policies not been excluded. Notwithstanding these deficiencies, which will render a strict comparison with the results of the Gotha Life Office impossible, Dr. Begbie's paper is still full of interest, and should be studied by every one connected with the management of Life Offices, or giving attention to the more general question of Vital Statistics. It will be impossible within the limits assigned to the present contribution to do justice to the discussion into which Dr. Begbie enters on the results of his investigation: those who desire to follow him in those important details, must have recourse to the paper itself. The following exhibits the deaths from different causes, for all ages collectively, in the Gotha Life Office, and in the Scottish Widows' Fund Life Assurance Society.

## ABSTRACT O.

| CAUSE OF DEATH.                                    | Gotha Life Office. |                              | Scottish Widows' Fund. |                              |
|----------------------------------------------------|--------------------|------------------------------|------------------------|------------------------------|
|                                                    | Number of Deaths.  | Per Centage to Total Deaths. | Number of Deaths.      | Per Centage to Total Deaths. |
| Epidemic and Contagious Diseases . . . . .         | 503                | 20·356                       | 93                     | 14·486                       |
| Diseases of uncertain seat . . . . .               | 380                | 15·378                       | 52                     | 8·100                        |
| Diseases of the Brain and Nerves . . . . .         | 375                | 15·176                       | 133                    | 20·720                       |
| Diseases of the Respiratory Organs . . . . .       | 688                | 27·843                       | 152                    | 23·676                       |
| Diseases of the Heart and Blood-Vessels . . . . .  | 69                 | 2·792                        | 53                     | 8·255                        |
| Diseases of the Organs of Digestion . . . . .      | 207                | 8·377                        | 77                     | 11·994                       |
| Diseases of the Urinary Organs . . . . .           | 40                 | 1·619                        | 23                     | 3·582                        |
| Childbirth and Diseases of the Uterus, &c. . . . . | 10                 | ·405                         | 5                      | ·779                         |
| Diseases of the Joints . . . . .                   | 18                 | ·729                         | 3                      | ·467                         |
| Violent Deaths . . . . .                           | 87                 | 3·521                        | 18                     | 2·803                        |
| Old Age . . . . .                                  | 86                 | 3·480                        | 6                      | ·934                         |
| Causes not specified . . . . .                     | 8                  | ·324                         | 27                     | 4·204                        |
| Total Deaths . . . . .                             | 2,471              | 100·000                      | 642                    | 100·000                      |

In the above Abstract the relation of the two classes of facts is obvious, and calls for no further commentary; but it may be useful to give the results for each class of disease in the Scottish Widows' Fund according to age.



## ABSTRACT P.

| DISEASE.                                   | Ages at Death. |           |           |           |           |           |           | Total. |
|--------------------------------------------|----------------|-----------|-----------|-----------|-----------|-----------|-----------|--------|
|                                            | 20 to 30.      | 30 to 40. | 40 to 50. | 50 to 60. | 60 to 70. | 70 to 80. | Above 80. |        |
| Epidemic and Contagious Diseases . . . .   | 5              | 15        | 28        | 18        | 22        | 4         | 1         | 93     |
| Diseases of uncertain seat . . . . .       | 2              | 4         | 7         | 15        | 14        | 9         | 1         | 52     |
| Diseases of the Brain and Nerves . . . .   | 5              | 14        | 36        | 34        | 29        | 14        | 1         | 133    |
| Diseases of the Respiratory Organs . . . . | 12             | 45        | 32        | 28        | 22        | 11        | 2         | 152    |
| Diseases of the Heart and Blood-Vessels .  | ...            | 9         | 11        | 15        | 13        | 3         | 2         | 53     |
| Diseases of the Organs of Digestion . . .  | 3              | 13        | 17        | 21        | 17        | 6         | ...       | 77     |
| Diseases of the Urinary Organs . . . . .   | ...            | 2         | 2         | 6         | 4         | 8         | 1         | 23     |
| Childbirth and Diseases of the Uterus, &c. | ...            | 2         | 3         | ...       | ...       | ...       | ...       | 5      |
| Diseases of the Joints . . . . .           | ...            | 1         | ...       | 1         | 1         | ...       | ...       | 3      |
| Violent Deaths . . . . .                   | 1              | 4         | 7         | 5         | 1         | ...       | ...       | 18     |
| Old Age . . . . .                          | ...            | ...       | ...       | ...       | ...       | 2         | 4         | 6      |
| Causes not specified or ascertained . . .  | ...            | ...       | ...       | ...       | ...       | ...       | ...       | 27     |
| All Diseases . . . . .                     | 28             | 109       | 143       | 143       | 123       | 57        | 12        | 642    |

In order that many of the preceding results may be clearly understood, it is necessary to direct attention to Tables XV and XVI, the former of which shews the progress of the Gotha Society, from 1829 to the end of the year 1849, and the latter shews the number and amount of assurances subsisting at the end of the year 1848.

TABLE XV.

*Number of Persons effecting Assurances during the Years 1829—49.*

| Year.  | Number of persons making new Proposals. | Number of persons effecting new Policies. | Gross number of persons Assured throughout the Year. | Persons on whose lives Policies were discontinued. |         |        | Persons on whose lives Policies were in force at the end of the Year. | Increase in the Year. | Average Age of the Assured. |         |
|--------|-----------------------------------------|-------------------------------------------|------------------------------------------------------|----------------------------------------------------|---------|--------|-----------------------------------------------------------------------|-----------------------|-----------------------------|---------|
|        |                                         |                                           |                                                      | Lapses.                                            | Deaths. | Total. |                                                                       |                       | Years.                      | Months. |
| 1829   | 1,581                                   | 1,285                                     | 1,285                                                | ...                                                | 12      | 12     | 1,273                                                                 | 1,273                 | 42                          | 7       |
| 1830   | 607                                     | 504                                       | 1,777                                                | 14                                                 | 16      | 30     | 1,747                                                                 | 474                   | 42                          | 9       |
| 1831   | 1,491                                   | 1,244                                     | 2,991                                                | 46                                                 | 27      | 73     | 2,918                                                                 | 1,171                 | 41                          | 10      |
| 1832   | 1,574                                   | 1,165                                     | 4,083                                                | 214                                                | 53      | 267    | 3,816                                                                 | 898                   | 42                          | 4½      |
| 1833   | 1,351                                   | 1,041                                     | 4,857                                                | 120                                                | 46      | 166    | 4,691                                                                 | 875                   | 42                          | 9       |
| 1834   | 1,218                                   | 902                                       | 5,593                                                | 156                                                | 65      | 221    | 5,372                                                                 | 681                   | 43                          | 1       |
| 1835   | 1,318                                   | 989                                       | 6,361                                                | 156                                                | 85      | 241    | 6,120                                                                 | 748                   | 43                          | 3½      |
| 1836   | 1,635                                   | 1,213                                     | 7,333                                                | 172                                                | 108     | 280    | 7,053                                                                 | 933                   | 43                          | 5       |
| 1837   | 1,581                                   | 1,151                                     | 8,204                                                | 174                                                | 123     | 297    | 7,907                                                                 | 854                   | 43                          | 8       |
| 1838   | 1,555                                   | 1,154                                     | 9,061                                                | 158                                                | 124     | 282    | 8,779                                                                 | 872                   | 44                          | 0       |
| 1839   | 1,419                                   | 1,024                                     | 9,802                                                | 199                                                | 123     | 322    | 9,481                                                                 | 702                   | 44                          | 4½      |
| 1840   | 1,485                                   | 1,089                                     | 10,570                                               | 200                                                | 136     | 336    | 10,234                                                                | 753                   | 44                          | 8¾      |
| 1841   | 1,414                                   | 983                                       | 11,217                                               | 184                                                | 158     | 342    | 10,875                                                                | 641                   | 45                          | 1       |
| 1842   | 1,352                                   | 1,013                                     | 11,888                                               | 174                                                | 191     | 365    | 11,523                                                                | 648                   | 45                          | 5       |
| 1843   | 1,503                                   | 1,049                                     | 12,572                                               | 195                                                | 201     | 396    | 12,176                                                                | 653                   | 45                          | 10      |
| 1844   | 1,493                                   | 1,073                                     | 13,249                                               | 186                                                | 197     | 383    | 12,866                                                                | 690                   | 46                          | 0       |
| 1845   | 1,412                                   | 1,018                                     | 13,884                                               | 181                                                | 235     | 416    | 13,468                                                                | 602                   | 46                          | 4       |
| 1846   | 1,484                                   | 1,096                                     | 14,564                                               | 214                                                | 224     | 438    | 14,126                                                                | 658                   | 46                          | 7       |
| 1847   | 1,706                                   | 1,235                                     | 15,361                                               | 244                                                | 289     | 533    | 14,828                                                                | 702                   | 46                          | 10      |
| 1848   | 1,151                                   | 824                                       | 15,652                                               | 291                                                | 325     | 616    | 15,036                                                                | 208                   | 47                          | 4       |
| 1849   | 1,377                                   | 1,011                                     | 16,047                                               | 239                                                | 337     | 576    | 15,471                                                                | 435                   | 47                          | 9       |
| Total. | 29,707                                  | 22,063                                    | 196,352                                              | 3,517                                              | 3,075   | 6,592  |                                                                       | 15,471                |                             |         |



The above will not correspond exactly in some of its details, particularly in relation to the number of deaths, with some of the preceding figures; in fact Table XV is a financial statement of the Society, and those conversant with the practical working of such institutions, will immediately understand the cause of such differences. The number of deaths which have actually taken place up to any given date being of necessity, in every large Society, greater than the payments made on account of deaths to the same date.

In the following Table will be found a statement of the number of assurances in the Gotha Life Office, subsisting on the 31st of December, 1848; to many persons the results may be interesting. The amounts assured are expressed in thalers, or rixdollars Prussian current, each being worth nearly three shillings sterling.

TABLE XVI.

*Assurances subsisting in 1848.*

| Age.      |          | 200—1,000 Thlr.               | 1,100—2,000 ..         | 2,100—3,000 ..         | 3,100—4,000 ..       | 4,100—5,000 ..       | 5,100—6,000 ..       | 6,100—7,000 ..    | 7,100—8,000 ..       | 8,100—9,000 ..    | 9,100—10,000 ..      | Total.                          |
|-----------|----------|-------------------------------|------------------------|------------------------|----------------------|----------------------|----------------------|-------------------|----------------------|-------------------|----------------------|---------------------------------|
| 15 to 20  | Persons. | 4                             | ...                    | ...                    | ...                  | ...                  | ...                  | ...               | ...                  | ...               | ...                  | 4 Persons 3,500 Thlr.           |
| 21 ... 25 |          | 77                            | 7                      | 1                      | ...                  | 2                    | ...                  | ...               | ...                  | ...               | ...                  | 87 ... 67,800 ...               |
| 26 ... 30 |          | 391                           | 73                     | 20                     | 8                    | 10                   | 3                    | 3                 | 3                    | 2                 | 9                    | 522 ... 692,200 ...             |
| 31 ... 35 |          | 882                           | 241                    | 71                     | 36                   | 34                   | 20                   | 3                 | 7                    | 2                 | 12                   | 1,308 ... 1,888,900 ...         |
| 36 ... 40 |          | 1,412                         | 387                    | 127                    | 64                   | 55                   | 23                   | 4                 | 14                   | 1                 | 22                   | 2,109 ... 3,077,600 ...         |
| 41 ... 45 |          | 1,759                         | 585                    | 178                    | 109                  | 69                   | 45                   | 5                 | 19                   | 2                 | 27                   | 2,798 ... 4,307,100 ...         |
| 46 ... 50 |          | 1,628                         | 618                    | 199                    | 146                  | 70                   | 37                   | 13                | 35                   | 1                 | 29                   | 2,776 ... 4,614,000 ...         |
| 51 ... 55 |          | 1,246                         | 478                    | 174                    | 94                   | 64                   | 41                   | 8                 | 19                   | 2                 | 21                   | 2,147 ... 3,562,000 ...         |
| 56 ... 60 |          | 843                           | 334                    | 118                    | 98                   | 69                   | 43                   | 7                 | 15                   | 3                 | 15                   | 1,545 ... 2,813,400 ...         |
| 61 ... 65 |          | 549                           | 217                    | 83                     | 60                   | 29                   | 21                   | 10                | 15                   | ...               | 6                    | 990 ... 1,750,500 ...           |
| 66 ... 70 |          | 279                           | 111                    | 32                     | 20                   | 19                   | 14                   | 4                 | 8                    | 1                 | 1                    | 489 ... 842,200 ...             |
| 71 ... 75 |          | 133                           | 37                     | 16                     | 15                   | 5                    | 3                    | ...               | 2                    | ...               | 1                    | 212 ... 327,700 ...             |
| 76 ... 84 |          | 80                            | 15                     | ...                    | 1                    | 1                    | 1                    | 1                 | ...                  | ...               | ...                  | 49 ... 64,800 ...               |
|           | Total.   | 9,233 Persons 6,611,100 Thlr. | 3,103 ... 5,337,900 .. | 1,019 ... 2,880,100 .. | 651 ... 2,534,200 .. | 427 ... 2,112,600 .. | 251 ... 1,499,100 .. | 58 ... 396,200 .. | 137 ... 1,089,000 .. | 14 ... 121,500 .. | 143 ... 1,429,500 .. | 15,036 Persons 24,011,200 Thlr. |



In the preceding Table there is one feature of an unusual character, and of much practical importance to Life Offices, the ratio of lapsed policies to the gross number of policies effected. It will be seen that out of 22,063 persons whose lives were assured, the policies on the lives of 3517 were either surrendered, forfeited, or had expired; being about 16 per cent. of the whole. To those not familiar with the experience of Life Offices in this respect, the proportion may seem high: but it is very much below that of Life Offices in this country, and merits serious consideration on the part of those transacting assurance business on the Continent.

The following Abstract will shew the results for the Gotha Life Office, the Equitable Society of London, and the fifteen Life Offices reported on in 1843 by the Committee of Actuaries.

## ABSTRACT Q.

| Source of Data.         | Date of Experience.                                                   | Entrants. | Existing at the termination of Experience. |                          | Discontinued. |                          | Died.   |                          |
|-------------------------|-----------------------------------------------------------------------|-----------|--------------------------------------------|--------------------------|---------------|--------------------------|---------|--------------------------|
|                         |                                                                       |           | Number.                                    | Per Centage to Entrants. | Number.       | Per Centage to Entrants. | Number. | Per Centage to Entrants. |
| Equitable Life Office.  | { 1762-1829, being 68 }<br>years .....                                | 21,398    | 6,930                                      | 32.4                     | 9,324         | 43.6                     | 5,144   | 24.0                     |
| Fifteen Life Offices. . | { 1772-1838, but chiefly }<br>from 1810-38, being }<br>29 years ..... | 40,616    | 25,462                                     | 62.7                     | 11,226        | 27.6                     | 3,928   | 9.7                      |
| Gotha Life Office. . .  | 1829-49, being 21 years ...                                           | 22,063    | 15,471                                     | 70.1                     | 3,517         | 16.0                     | 3,075   | 13.9                     |
| Combined Results...     | .....                                                                 | 84,077    | 47,863                                     | 56.9                     | 24,067        | 28.7                     | 12,147  | 14.4                     |

It is hence obvious that while the number of discontinued policies, being policies which have ceased to exist from all causes except death, is only about 16 per cent. of the original number of entrants in the Gotha Life Office, the ratio is as high as 43.6 per cent. in the Equitable, and even 27.6 per cent. in the fifteen Life Offices. It is to be regretted that the causes of discontinuance of the policies in each of those groups are unknown, but there is such a disparity in the results, that there can be very little doubt that a greater proportion of the policies issued on the Continent are kept in force for prudential reasons or family provisions, and that whether the increased ratio of discontinued policies in this country results from a greater proportion being originally effected for a temporary period only, still it is evident, from the fact of a less proportion of them being kept in force, that the prudential feelings among the assuring classes in Germany must be stronger than in this country.

The figures in the last column of Abstract Q, when viewed by themselves, can convey but little information, as the results are not derived from the number exposed to the risk of mortality, but from the original number of entrants, and consequently the rate of



mortality will depend on the ratio of discontinued policies, and the ages of the persons exposed to the risk of mortality.

In the following Abstract will be found the mortality per cent., without distinction of age, and the average duration of the assurances in each group of facts.

#### ABSTRACT R.

| Data.                   | Exposed to Risk. | Deaths. | Mortality per Cent. | Entrants. | Average Duration of each Policy. |
|-------------------------|------------------|---------|---------------------|-----------|----------------------------------|
| Equitable . . . . .     | 266,872          | 5,144   | 1.9                 | 21,398    | 12.5 years                       |
| Fifteen Offices . . . . | 220,787          | 3,928   | 1.8                 | 40,616    | 5.4 ...                          |
| Gotha Life Office . . . | 179,884          | 3,075   | 1.7                 | 22,063    | 8.1 ...                          |
| Total . . . . .         | 667,543          | 12,147  | 1.8                 | 84,077    | 7.9 ...                          |

The greater age of the Equitable Life Office destroys the value of any comparison between the results derived from the experience of that Society and either of the other sources of data; but a comparison may fairly be made between the results for the fifteen Life Offices and the Gotha Life Office. Fourteen of these Offices had on an average been established for eighteen years before the close of the experience here brought under review, and if the eldest office of the fifteen be included, the average duration of the term over which their transactions extend will not differ widely from that of the Gotha Life Office. This much being explained, it is certainly a very remarkable fact that the average duration of each policy effected in the English Life Offices should be less than five and a half years, and, in the Gotha Life Office, more than eight years. It is stated in the report by the Committee of Actuaries that, taking the whole of the data which they had under investigation, and which includes the above fifteen offices, and also the Equitable and Amicable Life Offices, the two oldest in existence, the average duration of all the policies is under eight years and a half. It is therefore evident that the interests of a Life Office, and particularly so in this country, are influenced by a great many other causes than simply the law of mortality prevailing among its members; and there is reason to believe that those disturbing causes will increase in intensity with the increased age and experience of the offices, and the gradual extension of the practice of Life Assurance among the population of this country.

In further illustration of this view the following analysis of the data furnished by the Committee of Actuaries, already referred to, will be of interest and importance to those connected with the management of life institutions. In order to construct Table XVII, it was necessary to make a very detailed analysis, shewing for policies effected at each quinquennium of age, the number of premiums received on each class of policies distinguished in the second, third, and fourth columns of the following Table.



The aggregate results so far as the policies in columns 3 and 4 are concerned is shewn in column 5. It is also necessary to explain that the amount assured by each policy was for the purpose of this illustration assumed to be £100, and that the scale of premiums payable under the policies was such as would be deduced from Table C, males, pp. 5-6 *ante*, calculated at 3 per cent. with a loading of 20 per cent.—a rate of premium which would be a fair average rate according to the present practice of life offices.

TABLE XVII

*Shewing the number of "Existing" and "Discontinued" Policies, the number of deaths which have taken place, and the ratio of the premiums which have been received on "Discontinued" Policies and Policies which have become "claims," to the sums paid on account of all the deaths which have happened.*

| Age when Assured. | Number of Policies. |                    |              |                                                | Amount of Premiums received on (c) = (d) | Sums paid for Deaths = (e) | Ratio of (d) to (e) | Age when Assured. |
|-------------------|---------------------|--------------------|--------------|------------------------------------------------|------------------------------------------|----------------------------|---------------------|-------------------|
|                   | Existing.           | Discontinued = (a) | Deaths = (b) | Number of Premiums received on (a) + (b) = (c) |                                          |                            |                     |                   |
|                   |                     |                    |              |                                                | £                                        | £                          |                     |                   |
| 1 to 5            | 10                  | 2                  |              | 7                                              | 10.50                                    |                            |                     | 1 to 5            |
| 6 ... 10          | 109                 | 48                 | 3            | 259                                            | 388.50                                   | 300                        | 129.500             | 6 ... 10          |
| 11 ... 15         | 207                 | 115                | 13           | 622                                            | 977.17                                   | 1300                       | 75.167              | 11 ... 15         |
| 16 ... 20         | 401                 | 332                | 38           | 1438                                           | 2571.17                                  | 3800                       | 67.662              | 16 ... 20         |
| 21 ... 25         | 1468                | 1130               | 106          | 4755                                           | 9547.95                                  | 10600                      | 90.075              | 21 ... 25         |
| 26 ... 30         | 3459                | 1643               | 288          | 8764                                           | 19788.82                                 | 28800                      | 68.711              | 26 ... 30         |
| 31 ... 35         | 4494                | 1870               | 458          | 11197                                          | 28697.89                                 | 45800                      | 62.659              | 31 ... 35         |
| 36 ... 40         | 4432                | 1819               | 500          | 11061                                          | 32674.58                                 | 50000                      | 65.349              | 36 ... 40         |
| 41 ... 45         | 3787                | 1454               | 495          | 9720                                           | 33611.66                                 | 49500                      | 67.902              | 41 ... 45         |
| 46 ... 50         | 2811                | 1162               | 542          | 8834                                           | 36440.14                                 | 54200                      | 67.233              | 46 ... 50         |
| 51 ... 55         | 1977                | 821                | 528          | 6918                                           | 34617.84                                 | 52800                      | 65.564              | 51 ... 55         |
| 56 ... 60         | 1318                | 473                | 453          | 4998                                           | 30947.82                                 | 45300                      | 68.317              | 56 ... 60         |
| 61 ... 65         | 719                 | 229                | 329          | 3177                                           | 24847.35                                 | 32900                      | 75.524              | 61 ... 65         |
| 66 ... 70         | 223                 | 98                 | 135          | 1102                                           | 11093.79                                 | 13500                      | 82.176              | 66 ... 70         |
| 71 ... 75         | 41                  | 24                 | 36           | 306                                            | 4048.37                                  | 3600                       | 112.455             | 71 ... 75         |
| 76 ... 80         | 6                   | 6                  | 4            | 45                                             | 795.96                                   | 400                        | 198.999             | 76 ... 80         |
| Total.....        | 25462               | 11226              | 3928         | 73203                                          | 271059 51                                | 392800                     | 69.012              | Total.            |

The ratios shewn in the 8th column of this Table will differ in some measure from the actual facts of the case, in consequence of fluctuations which may have taken place in the average of the amounts assured by "discontinued" policies, and by policies on which "claims" have arisen; and likewise in the disparity between the number of "short term" policies in the respective columns and those for the "whole of life"; but these objections will not in any serious way injure the practical value of the illustration furnished in the preceding Table.

It will be observed that between ages 26-60, the uniformity of the ratios in column 8, or the ratios of premiums received on the policies represented in columns 3 and 4, that is on discontinued policies of all sorts, to the amounts paid for claims, is very



remarkable: at the younger and older ages the numbers are small, and the results of course fluctuate. It thus appears that the premiums received on "discontinued" policies from all causes, death or otherwise, have, without any allowance being made for accumulation at interest, sufficed to meet 69·012 per cent. of the payments required on account of the deaths which have taken place. This is certainly a very striking fact when viewed in connection with the practice of life assurance, and will on reflection, after making full allowance for purchased or surrendered policies, be found to account to a very large extent for the enormous profits realised by some of the institutions from whose progress the preceding results are derived. It is not to be considered that the more recent experience of life offices is less remarkable: for as the practice of life assurance has gradually extended itself, the number of policies effected for purely prudential and family purposes is yearly becoming less and less in relation to the whole number effected; in consequence of the immense increase of assurances made on account of pecuniary arrangements of a temporary character. The future experience of Life Offices is, therefore, likely to exhibit results still more striking than those furnished in Table XVII.

It is obvious that in the process of constructing the preceding Tables, elements must have appeared by which it was easy to determine, from the experience of the fifteen offices now under consideration, the same class of facts as are exhibited for the Gotha Office in Abstract C, page 160 *ante*. The results of this part of the investigation will be found in the next Table.

TABLE XVIII.

*Period elapsed from the date of Assuring at various Ages till Death, of those dying among the Assured in the Fifteen Offices reported on by the Committee of Actuaries in 1843.*

| Age when Assured. | Number of Premiums received on each Policy. | Duration of Life. | Duration of Life to each Person. | Duration of Life. | Duration of Life to each Person. |
|-------------------|---------------------------------------------|-------------------|----------------------------------|-------------------|----------------------------------|
|                   |                                             | Years.            | Years.                           | Years.            | Years.                           |
| 6 to 10           | 3                                           | 18                | 6·000                            | }                 | 253                              |
| 11 ... 15         | 13                                          | 55                | 4·231                            |                   |                                  |
| 16 ... 20         | 38                                          | 180               | 4·737                            |                   |                                  |
| 21 ... 25         | 106                                         | 553               | 5·217                            | }                 | 2265                             |
| 26 ... 30         | 288                                         | 1712              | 5·944                            |                   |                                  |
| 31 ... 35         | 458                                         | 2799              | 6·111                            |                   |                                  |
| 36 ... 40         | 500                                         | 3241              | 6·482                            | }                 | 6040                             |
| 41 ... 45         | 495                                         | 3306              | 6·679                            |                   |                                  |
| 46 ... 50         | 542                                         | 3680              | 6·789                            |                   |                                  |
| 51 ... 55         | 528                                         | 3394              | 6·428                            | }                 | 6986                             |
| 56 ... 60         | 453                                         | 3004              | 6·631                            |                   |                                  |
| 61 ... 65         | 329                                         | 2210              | 6·717                            |                   |                                  |
| 66 ... 70         | 135                                         | 803               | 5·207                            | }                 | 6398                             |
| 71 ... 75         | 36                                          | 208               | 5·778                            |                   |                                  |
| 76 ... 80         | 4                                           | 26                | 6·5                              |                   |                                  |
| Total...          | 3928                                        | 25189             | 6·413                            |                   |                                  |



The results of this Table, although not shewing differences between the policies on young and old lives so marked as those in Abstract C, are still very remarkable; and strikingly corroborative of the operation of the principles which have been found to prevail in the Gotha Life Office. It will be seen that while in regard to the deaths which have taken place amongst persons assured at ages 21-30, the period which elapsed from the date of effecting the policy was 5.749 years, that which elapsed amongst those assuring in the decennium 41-50 was 6.736 years, the corresponding figures for the Gotha Office being 6.500 years and 9.750 years. After the observations which have been already made in pages 159-165, and also in pages 179-181, it is unnecessary to enlarge here on this part of the inquiry.

Before concluding the present contribution, it is necessary to state that, since I made the preceding investigation into the experience of the Gotha Life Office, Mr. Hopf, the Actuary of the Company, has published an able paper shewing the general results of the operations of the Society for the twenty-five years 1829-54, but not attempting to discuss the many curious and novel features which have arisen in this inquiry from the analysis of the data supplied by the annual reports of the Gotha Company. That the effect of the additional five years' experience on the preceding results may, however, be seen, the following Table is given, prepared on the model of Table XI, page 170 *ante*, from the facts furnished in Mr. Hopf's paper.

TABLE XIX.

| DISEASE.                                         | Ratio of Deaths from Different Causes during 1829 to 1854, at the following Ages. |                     |                |                     |                |                     |                |                     |                |                     |                |                     |                |                     |
|--------------------------------------------------|-----------------------------------------------------------------------------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|---------------------|
|                                                  | 15—30.                                                                            |                     | 31—40.         |                     | 41—50.         |                     | 51—60.         |                     | 61—70.         |                     | 71—87.         |                     | All Ages.      |                     |
|                                                  | Number of Lives at Risk during 1829—1854.                                         |                     |                |                     |                |                     |                |                     |                |                     |                |                     |                |                     |
|                                                  | 11,193                                                                            |                     | 65,378         |                     | 89,705         |                     | 59,592         |                     | 22,562         |                     | 3,459          |                     | 251,889        |                     |
|                                                  | No. of Deaths.                                                                    | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. | No. of Deaths. | Mortality per Cent. |
| Fever .....                                      | 22                                                                                | ·197                | 133            | ·203                | 197            | ·220                | 206            | ·346                | 123            | ·545                | 36             | 1·041               | 717            | ·285                |
| Influenza .....                                  | ..                                                                                | ..                  | 12             | ·018                | 12             | ·013                | 12             | ·020                | 20             | ·088                | 7              | ·202                | 63             | ·025                |
| Asiatic Cholera .....                            | ..                                                                                | ..                  | 18             | ·027                | 28             | ·031                | 36             | ·060                | 30             | ·133                | 8              | ·231                | 120            | ·048                |
| Exanthematic Diseases .....                      | 2                                                                                 | ·018                | 5              | ·008                | 2              | ·002                | 1              | ·002                | 1              | ·004                | ..             | ..                  | 11             | ·004                |
| Local Inflammation .....                         | 13                                                                                | ·116                | 95             | ·145                | 147            | ·164                | 157            | ·263                | 113            | ·501                | 29             | ·838                | 554            | ·211                |
| Gout and Rheumatism .....                        | 4                                                                                 | ·036                | 20             | ·032                | 32             | ·036                | 32             | ·054                | 34             | ·157                | 5              | ·145                | 127            | ·054                |
| Chronic Diseases of the Respiratory Organs ..... | 23                                                                                | ·206                | 163            | ·249                | 239            | ·266                | 181            | ·304                | 84             | ·372                | 8              | ·231                | 698            | ·277                |
| Chronic Abdominal Diseases .....                 | 1                                                                                 | ·009                | 57             | ·087                | 120            | ·134                | 161            | ·270                | 152            | ·674                | 27             | ·781                | 518            | ·205                |
| Organic Diseases of the Brain .....              | ..                                                                                | ..                  | 15             | ·024                | 27             | ·030                | 33             | ·055                | 21             | ·093                | 5              | ·145                | 101            | ·040                |
| Organic Diseases of the Spinal Marrow ..         | ..                                                                                | ..                  | 7              | ·011                | 12             | ·013                | 9              | ·015                | 15             | ·066                | 2              | ·057                | 45             | ·018                |
| Organic Diseases of the Heart .....              | 2                                                                                 | ·018                | 8              | ·012                | 27             | ·030                | 39             | ·065                | 38             | ·168                | 5              | ·145                | 119            | ·047                |
| Dropsy .....                                     | 3                                                                                 | ·027                | 24             | ·036                | 82             | ·091                | 140            | ·235                | 122            | ·541                | 35             | 1·012               | 406            | ·161                |
| Cancers and Malignant Ulcers .....               | ..                                                                                | ..                  | 3              | ·004                | 30             | ·033                | 27             | ·045                | 21             | ·093                | 11             | ·318                | 92             | ·036                |
| Apoplexy .....                                   | 7                                                                                 | ·063                | 34             | ·052                | 107            | ·119                | 233            | ·391                | 184            | ·816                | 58             | 1·677               | 623            | ·247                |
| Old Age .....                                    | ..                                                                                | ..                  | ..             | ..                  | ..             | ..                  | ..             | ..                  | 54             | ·239                | 115            | 3·325               | 169            | ·067                |
| Accidents .....                                  | ..                                                                                | ..                  | 9              | ·014                | 18             | ·020                | 16             | ·027                | 11             | ·049                | ..             | ..                  | 54             | ·021                |
| Murdered .....                                   | ..                                                                                | ..                  | 1              | ·001                | 1              | ·001                | 1              | ·002                | ..             | ..                  | ..             | ..                  | 3              | ·001                |
| Suicide .....                                    | 4                                                                                 | ·036                | 18             | ·027                | 29             | ·032                | 34             | ·056                | 14             | ·062                | 1              | ·029                | 109            | ·040                |
| Capital Punishment .....                         | ..                                                                                | ..                  | ..             | ..                  | 1              | ·001                | ..             | ..                  | ..             | ..                  | ..             | ..                  | 1              | ·000                |
| Total .....                                      | 81                                                                                | ·724                | 622            | ·951                | 1,111          | 1·239               | 1,318          | 2·212               | 1,037          | 4·596               | 352            | 10·176              | 4,521          | 1·794               |



The preceding results will not be found in any way to disturb the conclusions arrived at in the former part of this contribution; the rate of mortality, from the prolonged average duration of the policies and the consequent gradual disappearance of the effects of the original selection of the lives, being increased but to a very slight extent. The characteristic results of each class of disease is markedly similar to those already exhibited.

Since this investigation was originally made, Dr. Begbie has published another paper on the mortality which has taken place in the "Scottish Widows' Fund." It will be found in the "Monthly Journal of Medical Science" for August 1853, and includes the experience of the Society from its formation in 1815 to the close of the year 1852. In the same number of that publication will likewise be found a paper by Professor Christison, of Edinburgh, on the deaths which took place within the five years 1846-50 in the "Standard Assurance Company," of which he is the Medical Officer. Both papers are full of important and valuable information; and, as I have already remarked of Dr. Begbie's first paper, every one wishing to understand fully the contents of those now under consideration, must have recourse to the papers themselves; as it is here impossible to give more than such portions of the general results as bear directly on the questions already discussed in this contribution.

The following Table gives a succinct view of the three different classes of results:—

TABLE XX.

| CAUSE OF DEATH.                                   | Gotha Life Office.<br>1839-49. |                              | Scottish Widow's Fund.<br>1815-52. |                              | Standard Life Office.<br>1846-50. |                              |
|---------------------------------------------------|--------------------------------|------------------------------|------------------------------------|------------------------------|-----------------------------------|------------------------------|
|                                                   | No. of Deaths.                 | Per Centage to Total Deaths. | No. of Deaths.                     | Per Centage to Total Deaths. | No. of Deaths.                    | Per Centage to Total Deaths. |
| I. Epidemic and Contagious Diseases . . .         | 503                            | 20·356                       | 223                                | 16·742                       | 69                                | 23·549                       |
| II. Diseases of uncertain seat . . . . .          | 380                            | 15·378                       | 94                                 | 7·057                        | 15                                | 5·119                        |
| III. Diseases of the Brain and Nerves . . .       | 375                            | 15·176                       | 283                                | 21·246                       | 53                                | 18·089                       |
| IV. Diseases of the Respiratory Organs . . .      | 688                            | 27·843                       | 281                                | 21·096                       | 67                                | 22·867                       |
| V. Diseases of the Heart and Blood Vessels .      | 69                             | 2·792                        | 119                                | 8·934                        | 24                                | 8·191                        |
| VI. Diseases of the Organs of Digestion. . .      | 207                            | 8·377                        | 171                                | 12·838                       | 35                                | 11·945                       |
| VII. Diseases of the Urinary Organs . . . .       | 40                             | 1·619                        | 53                                 | 3·979                        | 6                                 | 2·048                        |
| VIII. Childbirth, and Diseases of the Uterus, &c. | 10                             | ·405                         | 10                                 | ·751                         | 2                                 | ·683                         |
| IX. Diseases of the Joints . . . . .              | 18                             | ·729                         | 7                                  | ·526                         | ...                               | ...                          |
| X. Violent Deaths . . . . .                       | 87                             | 3·521                        | 36                                 | 2·702                        | 9                                 | 3·072                        |
| XI. Old Age, and gradual decay . . . . .          | 86                             | 3·480                        | 27                                 | 2·027                        | 12                                | 4·096                        |
| XII. Causes not specified . . . . .               | 8                              | ·324                         | 28                                 | 2·102                        | 1                                 | ·341                         |
| Total Deaths . . . . .                            | 2,471                          | 100·000                      | 1,332                              | 100·000                      | 293                               | 100·000                      |

From the limited extent of the facts connected with the "Standard Life Office," extending over a period of five years only, and not including the whole experience of the



Company since its establishment in the year 1825, the results cannot be expected to assimilate closely to the other two classes of facts, but it will, nevertheless, be found that in some respects there is a remarkable agreement between them.

It is very interesting to observe, that between the results given for the Scottish Widows' Fund in Abstract O, based on 642 deaths only, there is an extraordinary agreement with those in the preceding Table, deduced from 1332 deaths in the same Society. It will also be observed, that the extended experience of this Society as now submitted shews almost the same relation to that of the Gotha Life Office as was formerly remarked; the deaths from diseases of the brain and the nervous system, from diseases of the heart and blood-vessels, from diseases of the organs of digestion, from diseases of the urinary organs, and from childbirth and diseases of the uterus, being in excess in the former, and the remaining classes of disease being in excess in the latter society; the relation being precisely that which was exhibited in Abstract O. This is a circumstance of some importance, and is well calculated to bestow confidence in the results of Dr. Begbie's inquiry.

It is, however, very deeply to be regretted that neither Dr. Begbie nor Professor Christison has been enabled to furnish the number of lives exposed to the risk of mortality at the corresponding ages at which the deaths are recorded to have taken place. This serious defect in the data of their papers deprives their investigations of much of their value, and every student of Vital Statistics must lament the absence of elements so essential to every exact inquiry. An inspection of the results presented in Tables XI, XII, XIII, XIV, and XIX, and in Abstracts H, K, L, M, and N, of this contribution, will confirm the more casual reader in this conclusion. In the absence of all information as to the number of lives exposed to the risk of mortality at different ages, the following Abstract is given that a comparison may be instituted between it and Abstract P, page 191.

## ABSTRACT S.

| DISEASE.                                         | AGES AT DEATH. |        |        |        |        |        |          | Total. |
|--------------------------------------------------|----------------|--------|--------|--------|--------|--------|----------|--------|
|                                                  | 20 to 30.      | 30—40. | 40—50. | 50—60. | 60—70. | 70—80. | Above 80 |        |
| I. Epidemic and Contagious Diseases . .          | 11             | 37     | 58     | 59     | 43     | 12     | 3        | 223    |
| II. Diseases of uncertain seat . . . . .         | 4              | 9      | 16     | 23     | 27     | 14     | 1        | 94     |
| III. Diseases of the Brain and Nerves . .        | 8              | 30     | 70     | 63     | 73     | 32     | 7        | 283    |
| IV. Diseases of the Respiratory Organs . .       | 19             | 65     | 60     | 57     | 44     | 26     | 10       | 281    |
| V. Diseases of the Heart and Blood Vessels       | 1              | 12     | 24     | 38     | 34     | 8      | 2        | 119    |
| VI. Diseases of the Organs of Digestion . .      | 8              | 20     | 35     | 54     | 35     | 19     | ...      | 171    |
| VII. Diseases of the Urinary Organs . . .        | ...            | 4      | 5      | 16     | 11     | 15     | 2        | 53     |
| VIII. Childbirth and Diseases of the Uterus, &c. | ...            | 3      | 6      | ...    | 1      | ...    | ...      | 10     |
| IX. Diseases of the Joints . . . . .             | ...            | 2      | 1      | 1      | 3      | ...    | ...      | 7      |
| X. Violent Deaths . . . . .                      | 1              | 10     | 12     | 10     | 2      | 1      | ...      | 36     |
| XI. Old Age . . . . .                            | ...            | ...    | ...    | ...    | ...    | 12     | 15       | 27     |
| XII. Causes not specified or ascertained . .     | ...            | ...    | ...    | ...    | ...    | ...    | ...      | 28     |
| Total . . . . .                                  | 52             | 192    | 287    | 321    | 273    | 139    | 40       | 1332   |







## ON THE RATE OF MORTALITY AMONG PERSONS OF INTEMPERATE HABITS.

---

In the next place it is proposed to investigate the rate of mortality which prevails among persons addicted to the immoderate use of intoxicating drinks. Assurance companies have generally declined to assure such lives, from the supposed greater mortality to which they were believed to be subject; but no attempt has been previously made to test this opinion by properly authenticated facts; and it is therefore hoped that the data now brought under consideration may not be without interest. The results are calculated to throw considerable light on a question not only curious in itself, but evidently of much importance to Life Offices, as well as to the public generally.

The remarkable efforts which have been recently made to reform the drinking usages of society will be a sufficient apology for bringing under attention statistical evidences on a subject so deeply affecting the social, moral, and religious condition of the people.

It may be well to remark, that, in collecting the present data, the intention was to include in the observations only such persons as were decidedly addicted to drinking habits, and it was not intended to bring within observation mere occasional drinkers, or what is usually termed generous or "free livers." The reasons for this distinction will hereafter appear. It may also be stated, that the primary reason for collecting the facts was to apply the results to life assurance operations, and it was consequently important to include only well-marked cases of intemperance. Examination will shew that, for social and moral purposes, this would also have been the only satisfactory course to follow; but that the plan adopted for obtaining the present collection of facts may be the better understood, the following circular and schedule are given:—

Medical, Invalid, and General Life Office,  
25, Pall Mall, London.

SIR,

I beg to inclose you forms for the collection of cases of the mortality of persons of intemperate habits.

Many difficulties have been experienced in attempts to procure satisfactory data on the value of life among persons addicted to the excessive use of intoxicating drinks, and therefore the present method has been resorted to, in order to increase the information on the subject. May I solicit your assistance in filling up any portion of the inclosed schedules; and should your knowledge of cases be so extensive as to require more than the number sent, others will be forwarded on hearing from you to that effect. If you could also suggest any gentleman who would be useful in giving the information required, I would put myself in communication with him on the subject.

Hoping I may calculate on your co-operation, I beg to direct your attention to the subjoined hints on filling up the schedules.

I am, SIR, your most obedient Servant,  
F. G. P. NEISON, Actuary,



N.B.—No case should be entered in the schedule unless the person alluded to was decidedly addicted to drinking habits during a considerable period of life.

The peculiar feature of the intemperance, whether the favourite beverage was fermented or distilled liquors, should be stated in the column "Remarks," and also whether the intemperance continued to the time of death.

If the correct age at death be known, it will be entered as such; if not, the age must be guessed or approximated to by whoever fills up the schedule, or by the *mean age* of that guessed at by two or three persons who may have known the individual in question.

The name in full, or at least the initials of the person in question, and also the place of death, should be entered in the columns set apart for that purpose. This will be necessary, in order to correct double entries which may be made by two different persons.

In the column of the "Cause of Death," insert the post mortem examination, if practicable, such as diseases of the heart, liver, lungs, kidneys, &c., &c., (*and perhaps terminating in dropsy, &c., &c.*)

Please to return the schedules as soon as you have entered all the cases which have come under your observation.

*It is not expected that the schedules can be always filled from registers or notes kept for the purpose; but generally from a distinct recollection of the cases, and an approximation to the truth is therefore all that is calculated on being obtained.*

#### INTEMPERANCE.—SCHEDULE.

| Description.               |      |                           | Death.   |           |         | Disease or Cause of Death. | Duration of Intemperance. | Remarks on the Peculiar Features of the Intemperate Habits; whether they existed up to the period of Death, and any other Observations necessary. |
|----------------------------|------|---------------------------|----------|-----------|---------|----------------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Name or other Distinction. | Sex. | Profession or Occupation. | Date of. | Place of. | Age at. |                            |                           |                                                                                                                                                   |
|                            |      |                           |          |           |         |                            |                           |                                                                                                                                                   |

It is obvious that it would be very difficult, if not impossible, to give such a definition of what constitutes intemperate habits as would be satisfactory to every one; almost every person would have a standard of his own by which to determine the fact of temperance or intemperance, and therefore in the preceding circular no attempt has been made to define the particular character of the habits on which information is sought; and all that has been urged on the attention of those filling up the schedules is to give only well-marked cases, and to include none but persons who were decidedly addicted to drinking habits. The consequence of following this course is, that the objections which might be urged against the adoption of any individual or peculiar test are avoided, for, by leaving it to each contributor of data to determine for himself what constitutes decidedly intemperate habits, the whole data taken collectively, from all the various contributors, will shew very precisely the result of those habits which the public, by common consent, admit to be intemperate; so that, however any individual reasoner on the results may argue, and whatever peculiar construction he may choose to put upon them, it will be impossible to avoid the conclusion, that the data really relate to what the public generally regard as persons of intemperate habits. If the testimony of those more advanced in life is to be fairly trusted on this subject, it must be admitted, that during the last quarter of a century, the drinking practices of society have much altered, and what is now commonly regarded



as free living, would have been looked upon some years since as only moderation; so, in like manner, may it be hoped that the usages of society will continue to improve, and, at no distant date, the habits now considered not to exceed the bounds of moderation be altogether unknown in polite and refined society. It is, therefore, possible that what has hitherto been regarded as intemperate habits, may differ very widely from that which may be looked upon as intemperance some years hence.

From the information obtained on these schedules, the following facts and results are derived; and it may here be stated that defective schedules have been completely rejected. For the mode by which the data have been analysed, reference may be made to the paper "on the Mortality of the Medical Profession," pp. 103-4 *ante*, and to that on the "Mortality of Master Mariners," pp. 134-137 *ante*. A similar plan has been followed in the present instance, and a careful perusal of those papers will make the method clearly understood, and shew how the facts have been brought into the form of the following Table:—

TABLE I.  
*Mortality among Persons of Intemperate Habits.*

| Age. | Number coming under Observation at each Age. | Number remaining under Observation from Age preceding. | Total Number under Observation at each Age. | Died. | Half of Entered. | Number Exposed to Risk. | Age. | Number coming under Observation at each Age. | Number remaining under Observation from Age preceding. | Total Number under Observation at each Age. | Died. | Half of Entered. | Number Exposed to Risk. |
|------|----------------------------------------------|--------------------------------------------------------|---------------------------------------------|-------|------------------|-------------------------|------|----------------------------------------------|--------------------------------------------------------|---------------------------------------------|-------|------------------|-------------------------|
| 14   | 1                                            | ..                                                     | 1                                           | ..    | .5               | .5                      | 53   | ..                                           | 105                                                    | 105                                         | 5     | ..               | 105                     |
| 15   | 3                                            | 1                                                      | 4                                           | ..    | 1.5              | 2.5                     | 54   | 1                                            | 100                                                    | 101                                         | 3     | .5               | 100.5                   |
| 16   | ..                                           | 4                                                      | 4                                           | ..    | ..               | 4                       | 55   | 2                                            | 98                                                     | 100                                         | 5     | 1                | 99                      |
| 17   | 7                                            | 4                                                      | 11                                          | 1     | 3.5              | 7.5                     | 56   | 1                                            | 95                                                     | 96                                          | 9     | .5               | 95.5                    |
| 18   | 5                                            | 10                                                     | 15                                          | ..    | 2.5              | 12.5                    | 57   | ..                                           | 87                                                     | 87                                          | 1     | ..               | 87                      |
| 19   | 4                                            | 15                                                     | 19                                          | ..    | 2                | 17                      | 58   | ..                                           | 86                                                     | 86                                          | 6     | ..               | 86                      |
| 20   | 29                                           | 19                                                     | 48                                          | ..    | 14.5             | 33.5                    | 59   | ..                                           | 80                                                     | 80                                          | 2     | ..               | 80                      |
| 21   | 7                                            | 48                                                     | 55                                          | 1     | 3.5              | 51.5                    | 60   | 1                                            | 78                                                     | 79                                          | 17    | .5               | 78.5                    |
| 22   | 15                                           | 54                                                     | 69                                          | 1     | 7.5              | 61.5                    | 61   | ..                                           | 62                                                     | 62                                          | ..    | ..               | 62                      |
| 23   | 6                                            | 68                                                     | 74                                          | 3     | 3                | 71                      | 62   | 1                                            | 62                                                     | 63                                          | 3     | .5               | 62.5                    |
| 24   | 14                                           | 71                                                     | 85                                          | 4     | 7                | 78                      | 63   | ..                                           | 60                                                     | 60                                          | ..    | ..               | 60                      |
| 25   | 19                                           | 81                                                     | 100                                         | 7     | 9.5              | 90.5                    | 64   | ..                                           | 60                                                     | 60                                          | 4     | ..               | 60                      |
| 26   | 11                                           | 93                                                     | 104                                         | 5     | 5.5              | 98.5                    | 65   | ..                                           | 56                                                     | 56                                          | 9     | ..               | 56                      |
| 27   | 14                                           | 99                                                     | 113                                         | 7     | 7                | 106                     | 66   | ..                                           | 47                                                     | 47                                          | 4     | ..               | 47                      |
| 28   | 20                                           | 106                                                    | 126                                         | 3     | 10               | 116                     | 67   | ..                                           | 43                                                     | 43                                          | 2     | ..               | 43                      |
| 29   | 9                                            | 123                                                    | 132                                         | 2     | 4.5              | 127.5                   | 68   | ..                                           | 41                                                     | 41                                          | 6     | ..               | 41                      |
| 30   | 35                                           | 130                                                    | 165                                         | 14    | 17.5             | 148.5                   | 69   | ..                                           | 35                                                     | 35                                          | 1     | ..               | 35                      |
| 31   | 9                                            | 151                                                    | 160                                         | 4     | 4.5              | 155.5                   | 70   | ..                                           | 34                                                     | 34                                          | 11    | ..               | 34                      |
| 32   | 18                                           | 156                                                    | 174                                         | 8     | 9                | 165                     | 71   | ..                                           | 23                                                     | 23                                          | 2     | ..               | 23                      |
| 33   | 18                                           | 166                                                    | 184                                         | 4     | 9                | 175                     | 72   | ..                                           | 21                                                     | 21                                          | 2     | ..               | 21                      |
| 34   | 13                                           | 180                                                    | 193                                         | 5     | 6.5              | 186.5                   | 73   | ..                                           | 19                                                     | 19                                          | 5     | ..               | 19                      |
| 35   | 15                                           | 188                                                    | 203                                         | 11    | 7.5              | 195.5                   | 74   | ..                                           | 14                                                     | 14                                          | 4     | ..               | 14                      |
| 36   | 13                                           | 192                                                    | 205                                         | 10    | 6.5              | 198.5                   | 75   | ..                                           | 10                                                     | 10                                          | 5     | ..               | 10                      |
| 37   | 5                                            | 195                                                    | 200                                         | 5     | 2.5              | 197.5                   | 76   | ..                                           | 5                                                      | 5                                           | ..    | ..               | 5                       |
| 38   | 8                                            | 195                                                    | 203                                         | 15    | 4                | 199                     | 77   | ..                                           | 5                                                      | 5                                           | ..    | ..               | 5                       |
| 39   | 4                                            | 188                                                    | 192                                         | 3     | 2                | 190                     | 78   | ..                                           | 5                                                      | 5                                           | 1     | ..               | 5                       |
| 40   | 19                                           | 189                                                    | 208                                         | 21    | 9.5              | 198.5                   | 79   | ..                                           | 4                                                      | 4                                           | ..    | ..               | 4                       |
| 41   | 5                                            | 187                                                    | 192                                         | 2     | 2.5              | 189.5                   | 80   | ..                                           | 4                                                      | 4                                           | 1     | ..               | 4                       |
| 42   | 1                                            | 190                                                    | 191                                         | 16    | .5               | 190.5                   | 81   | ..                                           | 3                                                      | 3                                           | 1     | ..               | 3                       |
| 43   | 5                                            | 175                                                    | 180                                         | 9     | 2.5              | 177.5                   | 82   | ..                                           | 2                                                      | 2                                           | ..    | ..               | 2                       |
| 44   | 2                                            | 171                                                    | 173                                         | 9     | 1                | 172                     | 83   | ..                                           | 2                                                      | 2                                           | ..    | ..               | 2                       |
| 45   | 8                                            | 164                                                    | 172                                         | 15    | 4                | 168                     | 84   | ..                                           | 2                                                      | 2                                           | 1     | ..               | 2                       |
| 46   | 2                                            | 157                                                    | 159                                         | 10    | 1                | 158                     | 85   | ..                                           | 1                                                      | 1                                           | ..    | ..               | 1                       |
| 47   | 1                                            | 149                                                    | 150                                         | 5     | .5               | 149.5                   | 86   | ..                                           | 1                                                      | 1                                           | ..    | ..               | 1                       |
| 48   | 5                                            | 145                                                    | 150                                         | 7     | 2.5              | 147.5                   | 87   | ..                                           | 1                                                      | 1                                           | ..    | ..               | 1                       |
| 49   | ..                                           | 143                                                    | 143                                         | 3     | ..               | 143                     | 88   | ..                                           | 1                                                      | 1                                           | ..    | ..               | 1                       |
| 50   | ..                                           | 140                                                    | 140                                         | 22    | ..               | 140                     | 89   | ..                                           | 1                                                      | 1                                           | ..    | ..               | 1                       |
| 51   | 1                                            | 118                                                    | 119                                         | 3     | .5               | 118.5                   | 90   | ..                                           | 1                                                      | 1                                           | 1     | ..               | 1                       |
| 52   | ..                                           | 116                                                    | 116                                         | 11    | ..               | 116                     | 91   | ..                                           | ..                                                     | ..                                          | ..    | ..               | ..                      |



This Table will be better understood by an examination of the following condensed abstract of it.

## ABSTRACT A.

| Age.        | Number Exposed to Risk. | Died. | Mortality per Cent. | Number Exposed to Risk. | Died. | Mortality per Cent. | England and Wales Mortality per Cent. | Proportion of Intemperance Mortality to that of England and Wales. | Number which ought to have died according to England and Wales. |
|-------------|-------------------------|-------|---------------------|-------------------------|-------|---------------------|---------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| 16 to 20    | 74.5                    | 1     | 1.342               | 74.5                    | 1     | 1.342               | .730                                  | 1.8                                                                | .5                                                              |
| 21 ... 25   | 352.5                   | 16    | 4.539               | 949.0                   | 47    | 4.953               | .974                                  | 5.1                                                                | 9.2                                                             |
| 26 ... 30   | 596.5                   | 31    | 5.197               |                         |       |                     |                                       |                                                                    |                                                                 |
| 31 ... 35   | 877.5                   | 32    | 3.647               | 1861.0                  | 86    | 4.620               | 1.110                                 | 4.2                                                                | 20.7                                                            |
| 36 ... 40   | 983.5                   | 54    | 5.491               |                         |       |                     |                                       |                                                                    |                                                                 |
| 41 ... 45   | 897.5                   | 51    | 5.682               | 1635.5                  | 98    | 5.992               | 1.452                                 | 4.1                                                                | 23.7                                                            |
| 46 ... 50   | 738.0                   | 47    | 6.369               |                         |       |                     |                                       |                                                                    |                                                                 |
| 51 ... 55   | 539.0                   | 27    | 5.009               | 966.0                   | 62    | 6.418               | 2.254                                 | 2.9                                                                | 21.8                                                            |
| 56 ... 60   | 427.0                   | 35    | 8.197               |                         |       |                     |                                       |                                                                    |                                                                 |
| 61 ... 65   | 300.5                   | 16    | 5.324               | 500.5                   | 40    | 7.992               | 4.259                                 | 1.9                                                                | 21.3                                                            |
| 66 ... 70   | 200.0                   | 24    | 12.000              |                         |       |                     |                                       |                                                                    |                                                                 |
| 71 ... 75   | 87.0                    | 18    | 20.690              | 110.0                   | 20    | 18.182              | 9.097                                 | 2.0                                                                | 10.0                                                            |
| 76 ... 80   | 23.0                    | 2     | 8.696               |                         |       |                     |                                       |                                                                    |                                                                 |
| 81 ... 85   | 10.0                    | 2     | 20.000              | 15.0                    | 3     | 20.000              | 19.904                                | 1.0                                                                | 3.0                                                             |
| 86 ... 90   | 5.0                     | 1     | 20.000              |                         |       |                     |                                       |                                                                    |                                                                 |
| Total ..... | 6111.5                  | 357   | 5.841               |                         | 357   |                     |                                       |                                                                    | 110.2                                                           |

These curious and remarkable results exhibit a rate of mortality for which the most careful observers will be generally unprepared. When intemperate lives are occasionally accepted by Life Offices, the rates of premium charged by them fall greatly short of what would be indicated by the preceding figures; and it is to be feared that a careful examination of their experience must shew that the arbitrary mode by which such peculiar risks have been estimated has led them into unprofitable speculations. Throughout the whole range of the Table, it will be seen that the rate of mortality is frightfully high, and unequalled by the results of any other series of observations made on any class of the



population of this country. Sanitary agitators have frequently excited alarm about the wholesale havoc in human life going on in the badly-conditioned districts of some of our large cities; but no collection of facts ever brought under attention has shewn so appalling a waste of life as is exhibited by the above results.

From the age of sixteen upwards, it will be seen that the rate of mortality exceeds that of the general population of England and Wales. In the 6111·5 years of life to which the observations extend, 357 deaths have taken place; but if these lives had been subject to the same rate of mortality as the population generally, the number of deaths would have been only 110, or not quite 31 per cent. At the term of life 21–30, the mortality is upwards of five times that of the general community; and in the succeeding twenty years of life, it is above four times as great, the difference, as might be expected, gradually becoming less and less as age advances. If there be anything, therefore, in the usages of society calculated to destroy life, the most powerful is certainly the inordinate use of strong drink.

From the preceding data the following Tables have been constructed, in order to exhibit more clearly the rate at which persons of intemperate habits die, and consequently the average duration of their lives.

The principles on which the methods of calculation, here employed, depend, are precisely the same as those which regulated the formation of the Tables in pp. 117–120, 129, and 145–148.

But that these principles may be more clearly understood, and the resulting processes defined, it may be useful to furnish some explanation of the method of interpolation employed in this and the preceding contributions, as some persons may be anxious to understand the precise steps of the argument which have led to the adoption of the principles here followed. They will be found fully demonstrated in an article in the “*Connaissance des Temps pour l’an 1847*,” by M. Fred. Maurice. Their first application to Mortality Tables will be found in my Report on the Bengal Military Fund, in 1849.

In this extract we must assume that the reader is acquainted with the method of finding the successive orders of differences, and also with the elementary expressions in the calculus of operations. We shall here adopt the usual notation of successive differences, though, for practical reasons, the exponents are placed at the bottom of the symbols where we have had occasion to use them in the former part of this work.

The proposition which we have to consider is as follows:—

Having a series of terms given, of which the differences of a certain order are constant, it is required to find any number of intermediate terms following the same law.

The difficulty lies in finding the differences of the interpolated series so as to suit



all cases,—whatever the number of terms to be interpolated may be, and whatever order of differences may happen to be constant in the given series.

We assume that in all cases in which the series consists of rational and integral functions, when equidistant terms have a certain order of differences constant, the intermediate numbers, if also equidistant, will have the same order of differences constant. [The proof of this is given by M. Maurice, but it is omitted here for the sake of brevity.]

Let there be two series, in one of which all the terms are given, and in the other only every  $h^{\text{th}}$ ; thus,

$$\begin{array}{cccccccccccccccc} v & & v_1 & & v_2 & & v_3 & & v_4 & & v_5 & \dots & v_x \\ u, u_1 & u_2 & u_3 & \dots & u_h & u_{h+1} & u_{h+2} & u_{h+3} & \dots & u_{2h} & u_{h+1} & \dots & u_{3h} & \dots & u_{4h} & \dots & u_{5h} & \dots & u_{xh} \end{array}$$

It is evident that if  $v = u$  and  $v_1 = u_h$  we shall have in every case

$$v_x = u_{xh}$$

Then denoting the differences of  $v$  by  $\Delta$ , and those of  $u$  by  $\delta$ , we shall have

$$u_1 = u + \delta u, \quad v_1 = v + \Delta v = u + \Delta v$$

whence

$$\Delta v = v_1 - u = u_h - u,$$

consequently, since, by the ordinary expression in the calculus of differences,

$$u_h = (1 + \delta)^h \cdot u, \quad \text{we have}$$

$$\Delta v = \{(1 + \delta)^h - 1\} \cdot u$$

Also because

$$v_1 = (1 + \Delta) v = u_h = (1 + \delta)^h u,$$

$$\therefore (1 + \delta) \cdot u = (1 + \Delta)^{\frac{1}{h}} \cdot v$$

and because  $v = u$

$$\delta u = \{(1 + \Delta)^{\frac{1}{h}} - 1\} \cdot u$$

which becomes in its general form

$$\delta^m u = \{(1 + \Delta)^{\frac{1}{h}} - 1\}^m \cdot u \quad \dots \quad (A)$$

So when  $m = 1$ , we have

$$\delta u = \{(1 + \Delta)^{\frac{1}{h}} - 1\} u = \left\{ \frac{\Delta}{h} + \frac{1 \cdot 1 - h}{1 \cdot 2} \cdot \frac{\Delta^2}{h^2} + \frac{1 \cdot 1 - h \cdot 1 - 2h}{1 \cdot 2 \cdot 3} \cdot \frac{\Delta^3}{h^3} + \dots \right\} \cdot u$$

Now let us take  $h = 5$ , and suppose  $\Delta^4 u$  constant; and for shortness put  $\frac{\Delta}{5} = k$ ; the co-efficient of  $\frac{\Delta^2}{h^2} = a$ ; the co-efficient of  $\frac{\Delta^3}{h^3} = b$ ; &c.



$$(1) \quad \delta u = \{k + a k^2 + b k^3 + c k^4\} u.$$

Consequently  $\delta^2 u$  will depend on the square of this value of  $\delta u$ ; but, as we neglect the powers of  $k$  above the 4<sup>th</sup>, if we put  $k + a k^2 = p$ , and  $b k^3 + c k^4 = q$ , we see that in the development of  $\delta^2 u = (p + q)^2 u$  we have to regard only the expression

$$\delta^2 u = (p^2 + 2 p q) u,$$

which gives us, rejecting  $k^5$  and  $k^6$ ,

$$(2) \quad \delta^2 u = \{k^2 + 2 a k^3 + (a^2 + 2 b) k^4\} u$$

Similarly  $\delta^3 u = (p + q)^3 u$

$$= (p^3 + 3 p^2 q + \dots) u$$

or rejecting the higher powers of  $k$ ,

$$(3) \quad \delta^3 u = \{k^3 + 3 a k^4\} u$$

and

$$(4) \quad \delta^4 u = \{k^4\} u$$

The numerical co-efficients are easily found.

$$\frac{1.1 - h}{1.2} = \frac{1.(-4)}{1.2} = -2 = a$$

$$a \cdot \frac{1 - 2h}{3} = -2 \cdot \frac{-9}{3} = 6 = b$$

$$b \cdot \frac{1 - 3h}{4} = 6 \cdot \frac{-14}{4} = -21 = c$$

also

$$2 a = -4 \quad a^2 + 2 b = 16$$

$$3 a = -6$$

which gives us, restoring  $\frac{\Delta}{5}$ , for which we used  $k$ ,

$$\delta u = \frac{\Delta u}{5} - 2 \frac{\Delta^2 u}{5^2} + 6 \frac{\Delta^3 u}{5^3} - 21 \frac{\Delta^4 u}{5^4}$$

$$\delta^2 u = \frac{\Delta^2 u}{5^2} - 4 \frac{\Delta^3 u}{5^3} + 16 \frac{\Delta^4 u}{5^4}$$

$$\delta^3 u = \dots \frac{\Delta^3 u}{5^3} - 6 \frac{\Delta^4 u}{5^4}$$

$$\delta^4 u = \dots \frac{\Delta^4 u}{5^4}$$



It will be more simple first to apply this method of interpolation to cases in which we shall have integral results: to polygonal numbers, for instance, or to series of powers, as follows:—

Let it be required to interpolate 4 terms between each of the following, 816, 1771, 3276, 5456, 8436, 12341.

By a process exactly the same as is exhibited on page 145, we have

| $u$   | $\Delta u$ | $\Delta^2 u$ | $\Delta^3 u$ | $\Delta^4 u$ |
|-------|------------|--------------|--------------|--------------|
| 816   | 955        |              |              |              |
| 1771  | 1505       | 550          | 125          |              |
| 3276  | 2180       | 675          | 125          | 0            |
| 5456  | 2980       | 800          | 125          | 0            |
| 8436  | 3905       | 925          |              |              |
| 12341 |            |              |              |              |

Here then  $h=5$  and  $\Delta^3 u$  is constant;  $\Delta^4 u$  and all higher = 0.

$$\Delta u = 955 \quad \therefore \frac{\Delta u}{h} = 191$$

$$\Delta^2 u = 550 \quad \therefore \frac{\Delta^2 u}{h^2} = 22$$

$$\Delta^3 u = 125 \quad \therefore \frac{\Delta^3 u}{h^3} = 1$$

(where 191, 22, and 1 answer respectively to  $a$ ,  $b$ , and  $c$ , in the formula at the bottom of page 145).

$$\text{Consequently } \delta u = 191 - 2.22 + 6.1 + 0 = 153$$

$$\delta^2 u = 22 - 4.1 + 0 = 18$$

$$\delta^3 u = \dots\dots\dots 1 + 0 = 1$$

We are now prepared to proceed in finding the first four of the numbers required to be interpolated (compare with Abstract G, page 146).



| $u$  | $\delta u$ | $\delta^2 u$ | $\delta^3 u$ |
|------|------------|--------------|--------------|
| 816  |            |              |              |
| 969  | 153        | 18           |              |
| 1140 | 171        | 19           | 1            |
| 1330 | 190        | 20           | 1            |
| 1540 | 210        | 21           |              |
|      | 231        | 22           |              |
| 1771 | 253        |              |              |

In the next step we proceed in precisely the same way; only using the next series of differences, 1505, 675, 125, instead of 955, 550, 125. And in like manner of the rest. But as the third differences are constant the process of finding the succeeding terms may be carried on by simple addition.

But if we attempt to find the last four numbers required in the same manner as we found the first, we can no longer take the differences in the same order of position as before. We are compelled to go upwards, and to take as the  $\Delta u$  for interpolating between 8436 and 12341, the numbers 3905, 925, and 125.

Now, having inverted the direction in which we have taken the  $\Delta u$ , we must invert the numbers between which we propose to interpolate.

In this case  $\Delta u$  will be negative, and must be written  $-3905$ ;

$\Delta^2 u$  ... positive, and remains unaltered, 925;

$\Delta^3 u$  ... negative, and must be written  $-125$ ;

consequently  $\frac{\Delta u}{5} = -781$ ;  $\frac{\Delta^2 u}{5^2} = 37$ ;  $\frac{\Delta^3 u}{5^3} = -1$ .

Whence  $\delta u = -781 - 2.37 - 6.1 = -861$ .

$\delta^2 u = 37 + 4 = 41$

$\delta^3 u = -1 = -1$

3 H



And the last four of the required numbers are found as here shewn:—

| $u$          | $\delta u$ | $\delta^2 u$ | $\delta^3 u$ |
|--------------|------------|--------------|--------------|
| <b>12341</b> |            |              |              |
| 11480        | —861       | 41           | —1           |
| 10660        | —820       | 40           |              |
| 9880         | —780       | 39           |              |
| 9139         | —741       | 38           |              |
| 8436         | —703       |              |              |

We now give an example in which the differences are not constant till we reach a higher order,—the fifth. Let the given series be 32768, 161051, 537824, 1419857, 3200000, 6436343, and 11881376, to interpolate two terms between each.

$h=3$ , and  $\Delta^5 u$  is constant,

$$\text{Making } u = 32768, \Delta u = 128283 \therefore \frac{\Delta u}{3} = 42761$$

$$\Delta^2 u = 248490 \quad \frac{\Delta^2 u}{3^2} = 27610$$

$$\Delta^3 u = 256770 \quad \frac{\Delta^3 u}{3^3} = 9510$$

$$\Delta^4 u = 136080 \quad \frac{\Delta^4 u}{3^4} = 1680$$

$$\Delta^5 u = 29160 \quad \frac{\Delta^5 u}{3^5} = 120$$

Referring to Equation (A) above, page 206, and making  $m$  equal successively to 1, 2, 3, 4, and 5, we have, rejecting the powers of  $k$  above the 5th,

$$\delta u = \{k + a k^2 + b k^3 + c k^4 + d k^5\} u$$

$$\delta^2 u = \{k^2 + 2a k^3 + (a^2 + 2b) k^4 + 2(ab + c) k^5\} u$$

$$\delta^3 u = \{k^3 + 3a k^4 + 3(a^2 + b) k^5\} u$$

$$\delta^4 u = \{k^4 + 4a k^5\} u$$

$$\delta^5 u = \{k^5\} u$$



For the numerical co-efficients we obtain

$$\frac{1.1-h}{1.2} = -1 = a$$

$$a \cdot \frac{1-2h}{3} = (-1) \cdot \left(-\frac{5}{3}\right) = \frac{5}{3} = b$$

$$b \cdot \frac{1-3h}{4} = \frac{5}{3}(-2) = -\frac{10}{3} = c$$

$$c \cdot \frac{1-4h}{5} = \left(-\frac{10}{3}\right) \cdot \left(-\frac{11}{5}\right) = \frac{22}{3} = d.$$

$$2a = -2 \quad a^2 + 2b = 1 + \frac{10}{3} = \frac{13}{3} \quad 2(ab + c) = -10$$

$$3a = -3 \quad 3(a^2 + b) = 3\left(1 + \frac{5}{3}\right) = 8$$

$$4a = -4.$$

In this case, the formula at the bottom of page 143 no longer serves us; first, because we have to interpolate two terms instead of five, which changes the co-efficients, and secondly, because the differences are carried farther, giving more steps in the process.

Putting  $\frac{\Delta u}{h} = a$ ,  $\frac{\Delta^2 u}{h^2} = b$ ,  $\frac{\Delta^3 u}{h^3} = c$ ,  $\frac{\Delta^4 u}{h^4} = d$ , and  $\frac{\Delta^5 u}{h^5} = e$ , the formula for the present case is:—

$$\delta u = a - b + \frac{5}{3}c - \frac{10}{3}d + \frac{22}{3}e = 26281$$

$$\delta^2 u = b - 2c + \frac{13}{3}d - 10e = 14670$$

$$\delta^3 u = c - 3d + 8e = 5430$$

$$\delta^4 u = d - 4e = 1200$$

$$\delta^5 u = e = 120$$

Whence the terms succeeding 32768 are 59049 and 100000, and we have the power of continuing the series as far as may be necessary; the successive differences being formed by simple addition.



In applying this method to the interpolation of mortality, it must be observed that in such investigations we very rarely, if ever, meet with any order of differences constant, or even the same for two successive periods. The differences generally vary for every period for which we have to interpolate, and it is assumed that the second or third or other difference, as the case may be, is constant during the period of two, three, or five years, to which we are for the time being paying attention. Every separate period requires its own particular calculation, because the process cannot be carried on as in the instances given above, without a fresh calculation of  $\delta u$ ,  $\delta^2 u$ ,  $\delta^3 u$ , &c.

In consequence of the assumption that the differences of a certain order are constant, when in strict correctness they are not, the method of calculation by inverted differences as described above (pp. 209-10) is sometimes adopted, and found to produce greater verisimilitude. The ordinary procedure is generally preferable, but frequently there is special reason foremploying the other.

The following shews how easily the method is applied to various cases:—

Suppose we have to interpolate six terms, fourth differences being constant.

$$a = \frac{\Delta u}{7}; \quad b = \frac{\Delta^2 u}{7^2}; \quad c = \frac{\Delta^3 u}{7^3}; \quad d = \frac{\Delta^4 u}{7^4}; \text{—}$$

$$\delta u = a - 3b + 13c - 65d$$

$$\delta^2 u = \quad b - 6c + 35d$$

$$\delta^3 u = \quad \quad c - 9d$$

$$\delta^4 u = \quad \quad \quad d$$

If the third differences are constant the fourth are 0: in that case  $65d$ , and the terms that stand below it  $= 0$ , and are neglected.

This explanation will, it is hoped, render the method of interpolation adopted in this volume quite intelligible.

The construction of Table III depends on the following principles:—

If, at a given age,  $d$  be the mortality per cent.,  $\frac{d}{100}$  is the probability of the death of a single individual. The sum of the probabilities of two incompatible events  $= 1$ . Consequently the probability of any individual of the given age living for a year longer is  $1 - \frac{d}{100}$ . Similarly with regard to the mortality and probability at any other age.



Let  $d_m, d_{m+1}, d_{m+2}, \dots, d_{m+x}$  represent the mortality per cent. at the ages  $m, m+1, m+2, \&c.$  up to  $m+x$ : and let  $l_m$  denote the number living at the age  $m$ , and  $l_{m+x}$  the number living at the age  $m+x$ , then

$$l_{m+x} = l_m \left(1 - \frac{d_m}{100}\right) \cdot \left(1 - \frac{d_{m+1}}{100}\right) \cdot \left(1 - \frac{d_{m+2}}{100}\right) \cdot \dots \cdot \left(1 - \frac{d_{m+x-1}}{100}\right)$$

Make  $m$  the initial age of the Table; and let  $l_m$  be the radix (in this Table  $l_m = 100,000$ ): the numbers living at each successive age are found by the process just given. The numbers of intemperate persons living at any specified age, are, on the average and in the long run, the same proportion of the number that enter on the destructive habit, as the number opposite the age in column 4 of this Table is of 100,000.

TABLE II.

*Interpolation of Mortality per Cent.*

$$\text{Interval} = \frac{1}{5}.$$

(1) = Original Quantities.

$\Delta_1$  and  $\Delta_2$  = 1st and 2nd Differences.

$$a = .2 \Delta_1$$

$$b = .04 \Delta_2$$

| Age. | (1.)   | $\Delta_1$    | $\Delta_2$     |
|------|--------|---------------|----------------|
| 16   | 1.342  | + 3.611       | - 3.944        |
|      |        | + .7222 = $a$ | - .15776 = $b$ |
| 26   | 4.953  | - .333        | + 1.705        |
|      |        | - .0666       | + .06820       |
| 36   | 4.620  | + 1.372       | - .946         |
|      |        | .2744         | - .03784       |
| 46   | 5.992  | .426          | + 1.148        |
|      |        | .0852         | .04592         |
| 56   | 6.418  | 1.574         | 8.616          |
|      |        | .3148         | + .34464       |
| 66   | 7.992  | 10.190        | - 8.372        |
|      |        | 2.0380        | - .33488       |
| 76   | 18.182 | 1.818         |                |
|      |        | + .3636       |                |
| 86   | 20.000 |               |                |



(1) = Interpolated Quantities,  $\delta_1 = a - 2b$ ,  $\delta_2 = b$ .

| Age.      | (1.)         | $\delta_1$ | Age.      | (1.)          | $\delta_1$ |
|-----------|--------------|------------|-----------|---------------|------------|
| <b>16</b> | <b>1.342</b> |            | <b>56</b> | <b>6.418</b>  |            |
| 18        | 2.37972      | + 1.03772  | 58        | 6.04352       | - .37448   |
| 20        | 3.25968      | .87996     | 60        | 6.01368       | - .02984   |
| 22        | 3.98188      | .72220     | 62        | 6.32848       | + .31480   |
| 24        | 4.54632      | .56444     | 64        | 6.98792       | .65944     |
|           |              | + .40668   |           |               | 1.00408    |
| <b>26</b> | <b>4.953</b> |            | <b>66</b> | <b>7.992</b>  |            |
| 28        | 4.75000      | - .20300   | 68        | 10.69976      | 2.70776    |
| 30        | 4.61520      | .13480     | 70        | 13.07264      | 2.37288    |
| 32        | 4.54860      | - .06660   | 72        | 15.11064      | 2.03800    |
| 34        | 4.55020      | + .00160   | 74        | 16.811376     | 1.70312    |
|           |              | .06980     |           |               | 1.36824    |
| <b>36</b> | <b>4.620</b> |            | <b>76</b> | <b>18.182</b> |            |
| 38        | 4.97008      | .35008     | 78        | 19.21536      | 1.03336    |
| 40        | 5.28232      | .31224     | 80        | 19.91384      | .69848     |
| 42        | 5.55672      | .27440     | 82        | 20.27744      | .36360     |
| 44        | 5.79328      | .23656     | 84        | 20.30616      | + .02872   |
|           |              | + .19872   |           |               | - .30616   |
| <b>46</b> | <b>5.992</b> |            | <b>86</b> | <b>20.000</b> |            |
| 48        | 5.98536      | - .00664   | ...       | ...           | ...        |
| 50        | 6.02464      | + .03928   | ...       | ...           | ...        |
| 52        | 6.10984      | .08520     | ...       | ...           | ...        |
| 54        | 6.24096      | .13112     | ...       | ...           | ...        |
|           |              | + .17704   |           |               | ...        |



*Second Interpolation.*

$$\text{Interval} = \frac{1}{2}.$$

$$d_1 = \frac{4}{10} \delta_1 - \frac{12}{100} \delta_2.$$

| Age. | (1).  | $d_1$ | Age. | (1).   | $d_1$ | Age. | (1).   | $d_1$ |
|------|-------|-------|------|--------|-------|------|--------|-------|
| 20   | 3.260 | +.308 | 47   | 5.984  | +.010 | 74   | 16.814 | +.587 |
| 21   | 3.568 |       | 48   | 5.985  |       | 75   | 17.401 |       |
| 22   | 3.982 | .245  | 49   | 5.995  | .029  | 76   | 18.182 | .453  |
| 23   | 4.127 |       | 50   | 6.055  |       | 77   | 18.635 |       |
| 24   | 4.546 | +.182 | 51   | 6.054  | .469  | 78   | 19.215 | .319  |
| 25   | 4.726 |       | 52   | 6.110  |       | 79   | 19.534 |       |
| 26   | 4.953 | -.089 | 53   | 6.579  | +.065 | 80   | 19.914 | .186  |
| 27   | 4.864 |       | 54   | 6.241  |       | 81   | 20.100 |       |
| 28   | 4.750 | .062  | 55   | 6.306  | -.191 | 82   | 20.277 | +.052 |
| 29   | 4.688 |       | 56   | 6.418  |       | 83   | 20.322 |       |
| 30   | 4.615 | .025  | 57   | 6.227  | -.053 | 84   | 20.306 | -.082 |
| 31   | 4.590 |       | 58   | 6.044  |       | 85   | 20.224 |       |
| 32   | 4.549 | -.008 | 59   | 5.991  | +.085 | 86   | 20.098 |       |
| 33   | 4.541 |       | 60   | 6.014  |       | 87   | 21.777 |       |
| 34   | 4.550 | +.020 | 61   | 6.099  | .282  | 88   | 23.095 |       |
| 35   | 4.570 |       | 62   | 6.328  |       | 89   | 24.687 |       |
| 36   | 4.620 | .145  | 63   | 6.610  | .360  | 90   | 26.277 |       |
| 37   | 4.765 |       | 64   | 6.988  |       | 91   | 27.877 |       |
| 38   | 4.970 | .130  | 65   | 7.348  | 1.123 | 92   | 29.582 |       |
| 39   | 5.100 |       | 66   | 7.992  |       | 93   | 31.127 |       |
| 40   | 5.282 | .114  | 67   | 9.115  | .989  | 94   | 32.817 |       |
| 41   | 5.396 |       | 68   | 10.700 |       | 95   | 34.297 |       |
| 42   | 5.557 | .099  | 69   | 11.689 | .855  | 96   | 35.572 |       |
| 43   | 5.656 |       | 70   | 13.073 |       | 97   | 36.644 |       |
| 44   | 5.793 | +.084 | 71   | 13.928 | .721  | 98   | 37.482 |       |
| 45   | 5.877 |       | 72   | 15.111 |       | 99   | 38.066 |       |
| 46   | 5.992 | -.008 | 73   | 15.832 |       | 100  | 38.650 |       |



TABLE III.

*Decremments and Rate of Mortality.—Intemperance.*

| Age. | Mortality<br>per Cent.<br>= $a$ .<br>$1 - \frac{a}{100}$ | $5 + \Sigma(c) = \lambda l$ .<br>$\lambda \left(1 - \frac{a}{100}\right) = c$ | Number<br>Living.<br>= $l$ . | Number<br>Dying. | Age. | Mortality<br>per Cent.<br>= $a$ .<br>$1 - \frac{a}{100}$ | $5 + \Sigma(c) = \lambda l$ .<br>$\lambda \left(1 - \frac{a}{100}\right) = c$ | Number<br>Living.<br>= $l$ . | Number<br>Dying. |
|------|----------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------|------------------|------|----------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------|------------------|
| 20   | 3.260                                                    | 5.00000                                                                       | 100,000                      | 3,259            | 46   | 5.992                                                    | 4.44849                                                                       | 28,086                       | 1,683            |
|      | .96740                                                   | 9.98561                                                                       |                              |                  |      | .94008                                                   | 9.97316                                                                       |                              |                  |
| 21   | 3.568                                                    | 4.98561                                                                       | 96,741                       | 3,452            | 47   | 5.984                                                    | .42165                                                                        | 26,403                       | 1,580            |
|      | .96432                                                   | .98422                                                                        |                              |                  |      | .94016                                                   | .97320                                                                        |                              |                  |
| 22   | 3.982                                                    | .96983                                                                        | 93,289                       | 3,715            | 48   | 5.985                                                    | .39485                                                                        | 24,823                       | 1,486            |
|      | .96018                                                   | .98235                                                                        |                              |                  |      | .94015                                                   | .97320                                                                        |                              |                  |
| 23   | 4.127                                                    | .95218                                                                        | 89,574                       | 3,697            | 49   | 5.995                                                    | .36805                                                                        | 23,337                       | 1,399            |
|      | .95873                                                   | .98170                                                                        |                              |                  |      | .94005                                                   | .97315                                                                        |                              |                  |
| 24   | 4.546                                                    | .93388                                                                        | 85,877                       | 3,902            | 50   | 6.025                                                    | .34120                                                                        | 21,938                       | 1,321            |
|      | .95454                                                   | .97980                                                                        |                              |                  |      | .93975                                                   | .97302                                                                        |                              |                  |
| 25   | 4.726                                                    | .91368                                                                        | 81,975                       | 3,873            | 51   | 6.054                                                    | .31422                                                                        | 20,617                       | 1,248            |
|      | .95274                                                   | .97898                                                                        |                              |                  |      | .93946                                                   | .97288                                                                        |                              |                  |
| 26   | 4.953                                                    | .89266                                                                        | 78,102                       | 3,868            | 52   | 6.110                                                    | .28710                                                                        | 19,369                       | 1,184            |
|      | .95047                                                   | .97794                                                                        |                              |                  |      | .93890                                                   | .97262                                                                        |                              |                  |
| 27   | 4.864                                                    | .87060                                                                        | 74,234                       | 3,612            | 53   | 6.579                                                    | .25972                                                                        | 18,185                       | 1,196            |
|      | .95136                                                   | .97834                                                                        |                              |                  |      | .93421                                                   | .97045                                                                        |                              |                  |
| 28   | 4.750                                                    | .84894                                                                        | 70,622                       | 3,355            | 54   | 6.241                                                    | .23017                                                                        | 16,989                       | 1,060            |
|      | .95250                                                   | .97886                                                                        |                              |                  |      | .93759                                                   | .97202                                                                        |                              |                  |
| 29   | 4.688                                                    | .82780                                                                        | 67,267                       | 3,153            | 55   | 6.306                                                    | .20219                                                                        | 15,929                       | 1,004            |
|      | .95312                                                   | .97915                                                                        |                              |                  |      | .93694                                                   | .97171                                                                        |                              |                  |
| 30   | 4.615                                                    | .80695                                                                        | 64,114                       | 2,959            | 56   | 6.418                                                    | .17390                                                                        | 14,925                       | 958              |
|      | .95385                                                   | .97948                                                                        |                              |                  |      | .93582                                                   | .97119                                                                        |                              |                  |
| 31   | 4.590                                                    | .78643                                                                        | 61,155                       | 2,808            | 57   | 6.227                                                    | .14509                                                                        | 13,967                       | 870              |
|      | .95410                                                   | .97959                                                                        |                              |                  |      | .93773                                                   | .97208                                                                        |                              |                  |
| 32   | 4.549                                                    | .76602                                                                        | 58,347                       | 2,654            | 58   | 6.044                                                    | .11717                                                                        | 13,097                       | 792              |
|      | .95451                                                   | .97978                                                                        |                              |                  |      | .93956                                                   | .97292                                                                        |                              |                  |
| 33   | 4.541                                                    | .74580                                                                        | 55,693                       | 2,529            | 59   | 5.991                                                    | .09009                                                                        | 12,305                       | 737              |
|      | .95459                                                   | .97982                                                                        |                              |                  |      | .94009                                                   | .97317                                                                        |                              |                  |
| 34   | 4.550                                                    | .72562                                                                        | 53,164                       | 2,418            | 60   | 6.014                                                    | .06326                                                                        | 11,568                       | 696              |
|      | .95450                                                   | .97978                                                                        |                              |                  |      | .93986                                                   | .97306                                                                        |                              |                  |
| 35   | 4.570                                                    | .70540                                                                        | 50,746                       | 2,320            | 61   | 6.099                                                    | .03632                                                                        | 10,872                       | 663              |
|      | .95430                                                   | .97968                                                                        |                              |                  |      | .93901                                                   | .97267                                                                        |                              |                  |
| 36   | 4.620                                                    | .68508                                                                        | 48,426                       | 2,238            | 62   | 6.328                                                    | 4.00899                                                                       | 10,209                       | 646              |
|      | .95380                                                   | .97946                                                                        |                              |                  |      | .93672                                                   | .97161                                                                        |                              |                  |
| 37   | 4.765                                                    | .66454                                                                        | 46,188                       | 2,199            | 63   | 6.610                                                    | 3.98060                                                                       | 9,563                        | 632              |
|      | .95235                                                   | .97880                                                                        |                              |                  |      | .93390                                                   | .97030                                                                        |                              |                  |
| 38   | 4.970                                                    | .64334                                                                        | 43,989                       | 2,187            | 64   | 6.988                                                    | .95090                                                                        | 8,931                        | 624              |
|      | .95030                                                   | .97786                                                                        |                              |                  |      | .93012                                                   | .96854                                                                        |                              |                  |
| 39   | 5.100                                                    | .62120                                                                        | 41,802                       | 2,131            | 65   | 7.348                                                    | .91944                                                                        | 8,307                        | 610              |
|      | .94900                                                   | .97727                                                                        |                              |                  |      | .92652                                                   | .96686                                                                        |                              |                  |
| 40   | 5.282                                                    | .59847                                                                        | 39,671                       | 2,096            | 66   | 7.992                                                    | .88630                                                                        | 7,697                        | 615              |
|      | .94718                                                   | .97643                                                                        |                              |                  |      | .92008                                                   | .96383                                                                        |                              |                  |
| 41   | 5.396                                                    | .57490                                                                        | 37,575                       | 2,027            | 67   | 9.115                                                    | .85013                                                                        | 7,082                        | 646              |
|      | .94604                                                   | .97591                                                                        |                              |                  |      | .90885                                                   | .95850                                                                        |                              |                  |
| 42   | 5.557                                                    | .55081                                                                        | 35,548                       | 1,976            | 68   | 10.700                                                   | .80863                                                                        | 6,436                        | 688              |
|      | .94443                                                   | .97517                                                                        |                              |                  |      | .89300                                                   | .95085                                                                        |                              |                  |
| 43   | 5.656                                                    | .52598                                                                        | 33,572                       | 1,898            | 69   | 11.689                                                   | .75948                                                                        | 5,748                        | 672              |
|      | .94344                                                   | .97472                                                                        |                              |                  |      | .88311                                                   | .94602                                                                        |                              |                  |
| 44   | 5.793                                                    | .50070                                                                        | 31,674                       | 1,835            | 70   | 13.073                                                   | .70550                                                                        | 5,076                        | 664              |
|      | .94207                                                   | .97409                                                                        |                              |                  |      | .86927                                                   | .93916                                                                        |                              |                  |
| 45   | 5.877                                                    | 4.47479                                                                       | 29,839                       | 1,753            | 71   | 13.928                                                   | 3.64466                                                                       | 4,412                        | 614              |
|      | .94123                                                   | 9.97370                                                                       |                              |                  |      | .86072                                                   | 9.93486                                                                       |                              |                  |



TABLE III.—(continued.)

| Age. | Mortality<br>per Cent.<br>= $a$ .<br>$1 - \frac{a}{100}$ . | $5 + \Sigma(c) = \lambda l$ .<br>$\lambda(1 - \frac{a}{100}) = c$ | Number<br>Living.<br>= $l$ . | Number<br>Dying. | Age. | Mortality<br>per Cent.<br>= $a$ .<br>$1 - \frac{a}{100}$ . | $5 + \Sigma(c) = \lambda l$ .<br>$\lambda(1 - \frac{a}{100}) = c$ | Number<br>Living.<br>= $l$ . | Number<br>Dying. |
|------|------------------------------------------------------------|-------------------------------------------------------------------|------------------------------|------------------|------|------------------------------------------------------------|-------------------------------------------------------------------|------------------------------|------------------|
| 72   | 15.111<br>.84889                                           | 3.57952<br>9.92886                                                | 3,798                        | 574              | 87   | 21.777<br>.78223                                           | 2.22168<br>9.89334                                                | 167                          | 37               |
| 73   | 15.832<br>.84168                                           | .50838<br>.92515                                                  | 3,224                        | 510              | 88   | 23.095<br>.76905                                           | .11502<br>.88596                                                  | 130                          | 30               |
| 74   | 16.814<br>.83186                                           | .43353<br>.92005                                                  | 2,714                        | 454              | 89   | 24.687<br>.75313                                           | 2.00098<br>.87687                                                 | 100                          | 25               |
| 75   | 17.401<br>.82599                                           | .35358<br>.91698                                                  | 2,257                        | 393              | 90   | 26.277<br>.73723                                           | 1.87785<br>.86761                                                 | 75                           | 19               |
| 76   | 18.182<br>.81818                                           | .27056<br>.91285                                                  | 1,864                        | 339              | 91   | 27.877<br>.72123                                           | .74546<br>.85808                                                  | 56                           | 16               |
| 77   | 18.635<br>.81365                                           | .18341<br>.91044                                                  | 1,525                        | 284              | 92   | 29.582<br>.70418                                           | .60354<br>.84769                                                  | 40                           | 12               |
| 78   | 19.215<br>.80785                                           | .09385<br>.90733                                                  | 1,241                        | 238              | 93   | 31.127<br>.68873                                           | .45123<br>.83805                                                  | 28                           | 9                |
| 79   | 19.534<br>.80466                                           | 3.00118<br>.90561                                                 | 1,003                        | 196              | 94   | 32.817<br>.67183                                           | .28928<br>.82726                                                  | 19                           | 6                |
| 80   | 19.914<br>.80086                                           | 2.90679<br>.90356                                                 | 807                          | 161              | 95   | 34.297<br>.65703                                           | 1.11654<br>.81759                                                 | 13                           | 4                |
| 81   | 20.100<br>.79900                                           | .81035<br>.90255                                                  | 646                          | 130              | 96   | 35.572<br>.64428                                           | 0.93413<br>.80908                                                 | 9                            | 3                |
| 82   | 20.277<br>.79723                                           | .71290<br>.90159                                                  | 516                          | 104              | 97   | 36.644<br>.63356                                           | .74321<br>.80179                                                  | 6                            | 2                |
| 83   | 20.322<br>.79678                                           | .61449<br>.90134                                                  | 412                          | 84               | 98   | 37.482<br>.62518                                           | .54500<br>.79601                                                  | 4                            | 2                |
| 84   | 20.306<br>.79694                                           | .51583<br>.90142                                                  | 328                          | 67               | 99   | 38.066<br>.61934                                           | .34101<br>.79193                                                  | 2                            | 1                |
| 85   | 20.224<br>.79776                                           | .41725<br>.90187                                                  | 261                          | 52               | 100  | 38.650<br>.61350                                           | 0.13294<br>9.78781                                                | 1                            | 1                |
| 86   | 20.098<br>.79902                                           | 2.31912<br>9.90256                                                | 209                          | 42               |      |                                                            |                                                                   |                              |                  |

By an inspection of the figures in Table IV which is derived from Table III, it will be seen that an intemperate person of age 20 has an equal chance of living 15.6 years ; while a person of the general population of the country at the same age has an equal chance of living 44.2 years longer. Again, at age 30, the intemperate person has an equal chance of 13.8 years, and the other of 36.5 years. Also, at age 40, the chance of the one is 11.6 years, and of the other 28.8 years. The following will shew the results at different ages:—

TABLE IV.

*Equation of Life, being the Period of Years of which there is an equal chance of living, among the*

| Ages. | General Population,<br>England and Wales. | Persons of Intemperate Habits. |                                                                 |
|-------|-------------------------------------------|--------------------------------|-----------------------------------------------------------------|
| 20    | 44.212                                    | 15.557, being 35 per cent.     | } of the dura-<br>tion of life in<br>the general<br>population. |
| 30    | 36.482                                    | 13.800, ... 38 ...             |                                                                 |
| 40    | 28.790                                    | 11.627, ... 40 ...             |                                                                 |
| 50    | 21.255                                    | 10.860, ... 51 ...             |                                                                 |
| 60    | 14.285                                    | 8.947, ... 63 ...              |                                                                 |



It would be curious to contrast with the above results the rate of mortality among persons who have been for a considerable period of years, or for the whole of life, abstainers from intoxicating drinks; but, unfortunately, there are no available data connected with this class of lives, and it seems there will long be considerable difficulty in procuring such information. A few years ago, Mr. Munro, of Enfield, at much trouble and expense, procured returns from Rechabite societies, shewing the rate of mortality and sickness experienced by the members, and it is known that the results, although not published, exhibit as high a rate of mortality and sickness as is found to prevail among the members of other friendly societies. The facts collected by Mr. Munro are of great value, and it is to be regretted that the societies furnishing them should, on account of the unfavourable nature of the results arrived at, object to their publication. For, although they shew a high rate of mortality, it should be kept in view that all the members cannot yet be fairly considered as the type of genuine abstainers; many of them are reformed drunkards, and, as such, have become teetotallers, with broken-down constitutions. It may therefore be justly stated, that until Rechabite societies have enrolled a class of members who have been abstainers from infancy, they cannot expect an entire immunity from those diseases and deteriorating influences on health to which less careful members of the community are subject.

In a most valuable paper read before the Statistical Society by Colonel Sykes, in the year 1851, will be found some remarkable facts as to the influence of intemperance on the sickness and mortality of European troops in the Madras presidency. Mr. Balfour, in his paper on Cholera, also gives some striking examples of the same class of results.

The facts collected in the preceding Schedule required an enumeration of the peculiar features of the intemperance in respect to the favourite beverage; and it is curious to remark the influence of the different kinds of drink on the duration of life.

The average duration of life, after the commencement of the intemperate habits, is,

|                                                                    |             |
|--------------------------------------------------------------------|-------------|
| Among beer drinkers . . . . .                                      | 21·7 years. |
| ... spirit drinkers . . . . .                                      | 16·7 ...    |
| And among those who drink both spirits and beer indiscriminately . | 16·1 ...    |

and, consequently, the rate of mortality will be,

|                               |                         |
|-------------------------------|-------------------------|
| Among beer drinkers . . . . . | 4·597 per cent. yearly. |
| ... spirit drinkers . . . . . | 5·996 ...               |
| ... mixed drinkers . . . . .  | 6·194 ...               |

Intemperate indulgence in the use of distilled liquors is hence more hurtful to health than the like use of fermented liquors, but the immoderate use of both combined is more injurious than the exclusive use of the one kind only.

These results are, however, not more curious than those connected with the different classes of persons.

The following shews the average duration of life, after the commencement of intemperate habits, among different classes of persons, namely:—



Among mechanics, working and labouring men . . . 18 years.  
 ... traders, dealers, and merchants . . . . . 17 ...  
 ... professional men and gentlemen . . . . . 15 ...  
 ... females . . . . . 14 ...

Among the general population, the distinction observable between the first two and the third of the classes is also known to exist, and the more regular and active physical exercises to which the members of the first two groups are subject, are very probably to a great extent the cause of the difference not only among the general population, but also among the intemperate persons now under observation.

It is obvious that none of the public records of this country connected with the hospitals or other public institutions, nor the returns of the Registrar-General, afford any means of knowing or ascertaining the number of deaths which take place from the use of intoxicating drinks. It is believed, that the present materials furnish better evidence on this question than anything else extant. In the returns of the Registrar-General, the nosological system adopted indicates what were the habits of the persons whose deaths are recorded in two instances only, namely, when the immediate cause of death appears under the term *delirium tremens*, or *intemperance*. It is, therefore, evident that those must embrace but a very small number of the deaths which actually take place among persons addicted to intemperate habits.

The following Table shews the deaths which happened from different causes among the facts now collected:—

TABLE V.  
*Immediate Cause of Death.*

| Immediate Cause of Death.   | Number of Deaths at the following Ages: |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|-----------------------------|-----------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                             | 16 to 20.                               | 21 to 25. | 26 to 30. | 31 to 35. | 36 to 40. | 41 to 45. | 46 to 50. | 51 to 55. | 56 to 60. | 61 to 65. | 66 to 70. | 71 to 75. | 76 to 80. | 81 to 85. | 86 to 90. |
| Apoplexy . . . . .          | ..                                      | ..        | 2         | 1         | 5         | 4         | 5         | 2         | 2         | 1         | 1         | ..        | 1         | ..        | ..        |
| Brain . . . . .             | ..                                      | ..        | ..        | 1         | ..        | 1         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Inflammation of Brain . . . | ..                                      | ..        | ..        | ..        | 1         | ..        | 1         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
| Paralysis . . . . .         | ..                                      | ..        | 1         | ..        | ..        | ..        | 1         | ..        | ..        | ..        | 1         | 2         | ..        | ..        | ..        |
| Brain Fever . . . . .       | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
| Insanity . . . . .          | ..                                      | ..        | ..        | 1         | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Delirium Tremens . . . . .  | ..                                      | ..        | 3         | 3         | 7         | 5         | 7         | 3         | 4         | 1         | 2         | 2         | 1         | ..        | ..        |
| Tetanus . . . . .           | ..                                      | 2         | 7         | 10        | 16        | 10        | 5         | 3         | 2         | ..        | ..        | 2         | ..        | ..        | ..        |
|                             | ..                                      | ..        | ..        | ..        | ..        | ..        | 1         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
|                             | ..                                      | 2         | 10        | 13        | 23        | 15        | 13        | 6         | 7         | 1         | 2         | 4         | 1         | ..        | ..        |
| Disease of Chest . . . . .  | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        |
| Decay of Nature . . . . .   | ..                                      | ..        | ..        | ..        | 1         | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | 1         | 1         |
| Phthisis . . . . .          | ..                                      | 5         | 7         | 6         | 5         | 4         | 6         | 6         | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
| Atrophy . . . . .           | ..                                      | ..        | 1         | ..        | ..        | 3         | 3         | ..        | ..        | 1         | 2         | ..        | ..        | ..        | ..        |
| Cancer of Gums and Tongue . | ..                                      | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Inflammation of Lungs . . . | ..                                      | ..        | ..        | ..        | 1         | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
| Hydrothorax . . . . .       | ..                                      | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | 1         | 1         | ..        | ..        | ..        | ..        |
| Pulmonary Consumption . . . | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        |
| Pneumonia . . . . .         | ..                                      | ..        | 3         | ..        | 1         | 1         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Empyema . . . . .           | ..                                      | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Decline . . . . .           | ..                                      | ..        | ..        | ..        | 1         | 1         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Bronchitis . . . . .        | 1                                       | ..        | ..        | ..        | 1         | ..        | ..        | ..        | 2         | 1         | ..        | ..        | ..        | ..        | ..        |
| Asthma . . . . .            | ..                                      | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        |
| Hæmoptysis . . . . .        | ..                                      | 1         | 1         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
|                             | 1                                       | 6         | 12        | 7         | 11        | 11        | 10        | 8         | 5         | 4         | 5         | ..        | ..        | 1         | 1         |



TABLE V.—(continued.)

| Immediate Cause of Death.          | Number of Deaths at the following Ages: |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|------------------------------------|-----------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                                    | 16 to 20.                               | 21 to 25. | 26 to 30. | 31 to 35. | 36 to 40. | 41 to 45. | 46 to 50. | 51 to 55. | 56 to 60. | 61 to 65. | 66 to 70. | 71 to 75. | 76 to 80. | 81 to 85. | 86 to 90. |
| Liver Disease and Dropsy . . . . . | ..                                      | 1         | 1         | 2         | ..        | 2         | 2         | 3         | 2         | 2         | 2         | 2         | 1         | ..        | ..        |
| Dropsy . . . . .                   | ..                                      | 1         | 1         | 2         | 3         | 3         | 3         | ..        | 5         | 2         | 2         | 4         | ..        | ..        | ..        |
| Stomach Disease . . . . .          | ..                                      | 1         | ..        | ..        | 1         | ..        | 2         | 1         | 2         | ..        | 1         | ..        | ..        | ..        | ..        |
| Liver Disease . . . . .            | ..                                      | ..        | 1         | ..        | 1         | 3         | 6         | 3         | 2         | ..        | 3         | ..        | ..        | ..        | ..        |
| Liver Disease, Atrophy . . . . .   | ..                                      | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Disease of Viscera . . . . .       | ..                                      | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Hepatitis . . . . .                | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | 1         | 2         | 1         | ..        | ..        | ..        |
| Ascites . . . . .                  | ..                                      | 1         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        |
|                                    | ..                                      | 4         | 3         | 6         | 6         | 8         | 13        | 8         | 11        | 6         | 10        | 7         | 1         | ..        | ..        |
| Gout . . . . .                     | ..                                      | ..        | ..        | ..        | ..        | 2         | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
| Rheumatism . . . . .               | ..                                      | ..        | ..        | ..        | 1         | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
| Heart Disease . . . . .            | ..                                      | ..        | ..        | ..        | 1         | 1         | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Aneurism . . . . .                 | ..                                      | ..        | ..        | 1         | ..        | 1         | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
|                                    | ..                                      | ..        | ..        | 1         | 2         | 4         | 2         | ..        | 2         | ..        | ..        | ..        | ..        | ..        | ..        |
| Urinary Organs . . . . .           | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        |
| Enteritis . . . . .                | ..                                      | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Retention of Urine . . . . .       | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        |
| Ulceration of Bladder . . . . .    | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        |
| Disease of Kidneys . . . . .       | ..                                      | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Ileus . . . . .                    | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
|                                    | ..                                      | ..        | ..        | ..        | ..        | ..        | 2         | 1         | ..        | 1         | ..        | 1         | ..        | 1         | ..        |
| Peritonitis . . . . .              | ..                                      | ..        | 2         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Ulceration of Bowels . . . . .     | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        |
| Gastro-Enteritis . . . . .         | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 2         | ..        | ..        | ..        | ..        |
| Intussusception . . . . .          | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        |
|                                    | ..                                      | ..        | 2         | ..        | 1         | ..        | ..        | ..        | ..        | 1         | 3         | ..        | ..        | ..        | ..        |
| Typhus Fever . . . . .             | ..                                      | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Fever . . . . .                    | ..                                      | ..        | 1         | 2         | 1         | 2         | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
| Inflammation and Gastric Fever     | ..                                      | ..        | ..        | ..        | 1         | 1         | ..        | ..        | 1         | 2         | ..        | ..        | ..        | ..        | ..        |
|                                    | ..                                      | 1         | 1         | 2         | 2         | 3         | ..        | ..        | 2         | 2         | ..        | ..        | ..        | ..        | ..        |
| Cholera . . . . .                  | ..                                      | ..        | ..        | ..        | 1         | 1         | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Diarrhoea . . . . .                | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        |
|                                    | ..                                      | ..        | ..        | ..        | 1         | 1         | 1         | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        |
| Suicide . . . . .                  | ..                                      | 2         | 1         | 1         | 2         | 2         | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Found Drowned . . . . .            | ..                                      | ..        | ..        | 2         | 2         | 1         | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        |
| Falls . . . . .                    | ..                                      | 1         | 1         | ..        | 1         | ..        | 2         | ..        | 1         | ..        | ..        | 1         | ..        | ..        | ..        |
| Not stated . . . . .               | ..                                      | ..        | ..        | ..        | 2         | 1         | ..        | ..        | 4         | ..        | 3         | 2         | ..        | ..        | ..        |
| Erysipelas . . . . .               | ..                                      | ..        | ..        | ..        | ..        | 1         | 1         | 1         | ..        | ..        | ..        | 1         | ..        | ..        | ..        |
| Coma . . . . .                     | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | 1         | ..        | ..        | ..        |
| Gangrene . . . . .                 | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        |
| Intoxication . . . . .             | ..                                      | ..        | ..        | ..        | ..        | 3         | 2         | 1         | 2         | ..        | ..        | ..        | ..        | ..        | ..        |
| Syphilis . . . . .                 | ..                                      | ..        | 1         | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Injury of Testicle . . . . .       | ..                                      | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
| Hæmatemesis . . . . .              | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        |
| Burns . . . . .                    | ..                                      | ..        | ..        | ..        | ..        | ..        | ..        | 1         | ..        | ..        | ..        | ..        | ..        | ..        | ..        |
|                                    | ..                                      | 1         | 2         | 2         | 6         | 7         | 5         | 4         | 8         | ..        | 4         | 6         | ..        | ..        | ..        |



The following Abstract of this Table will give a condensed view of the general results arrived at:—

## ABSTRACT B.

*Immediate Cause of Death.*

| Immediate Cause of Death.                                    | Number of Deaths at the following Ages: |           |           |           |           |           |           |           |           |           |           |           |           |           |           | Total. |
|--------------------------------------------------------------|-----------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------|
|                                                              | 16 to 20.                               | 21 to 25. | 26 to 30. | 31 to 35. | 36 to 40. | 41 to 45. | 46 to 50. | 51 to 55. | 56 to 60. | 61 to 65. | 66 to 70. | 71 to 75. | 76 to 80. | 81 to 85. | 86 to 90. |        |
| Head Diseases . . . . .                                      | ...                                     | 2         | 10        | 13        | 23        | 15        | 13        | 6         | 7         | 1         | 2         | 4         | 1         | ...       | ...       | 97     |
| Respiratory Organs . . . . .                                 | 1                                       | 6         | 12        | 7         | 11        | 11        | 10        | 8         | 5         | 4         | 5         | ...       | ...       | 1         | 1         | 82     |
| Liver Disease and Dropsy . . . . .                           | ...                                     | 4         | 3         | 6         | 6         | 8         | 13        | 8         | 11        | 6         | 10        | 7         | 1         | ...       | ...       | 83     |
| Gout, Rheumatism, and Heart . . . . .                        | ...                                     | ...       | ...       | 1         | 2         | 4         | 2         | ...       | 2         | ...       | ...       | ...       | ...       | ...       | ...       | 11     |
| Urinary Organs . . . . .                                     | ...                                     | ...       | ...       | ...       | ...       | ...       | 2         | 1         | ...       | 1         | ...       | 1         | ...       | 1         | ...       | 6      |
| Bowel Disease . . . . .                                      | ...                                     | ...       | 2         | ...       | 1         | ...       | ...       | ...       | ...       | 1         | 3         | ...       | ...       | ...       | ...       | 7      |
| Fevers . . . . .                                             | ...                                     | 1         | 1         | 2         | 2         | 3         | ...       | ...       | 2         | 2         | ...       | ...       | ...       | ...       | ...       | 13     |
| Cholera and Diarrhœa . . . . .                               | ...                                     | ...       | ...       | ...       | 1         | 1         | 1         | ...       | ...       | 1         | ...       | ...       | ...       | ...       | ...       | 4      |
| Suicide . . . . .                                            | ...                                     | 2         | 1         | 1         | 2         | 2         | 1         | ...       | ...       | ...       | ...       | ...       | ...       | ...       | ...       | 9      |
| Other Diseases . . . . .                                     | ...                                     | 1         | 2         | 2         | 6         | 7         | 5         | 4         | 8         | ...       | 4         | 6         | ...       | ...       | ...       | 45     |
| Total . . . . .                                              | 1                                       | 16        | 31        | 32        | 54        | 51        | 47        | 27        | 35        | 16        | 24        | 18        | 2         | 2         | 1         | 357    |
| Delirium Tremens, included }<br>in Head Diseases . . . . . } | ...                                     | 47        |           | 86        |           | 98        |           | 62        |           | 40        |           | 20        |           | 3         |           | 57     |
| Intemperance . . . . .                                       | ...                                     | 2         | 7         | 10        | 16        | 10        | 5         | 3         | 2         | ...       | ...       | 2         | ...       | ...       | ...       |        |
|                                                              | ...                                     | ...       | ...       | ...       | ...       | 3         | 2         | 1         | 2         | ...       | ...       | ...       | ...       | ...       | ...       | 8      |
|                                                              |                                         | 9         |           | 26        |           | 20        |           | 8         |           | 2         |           | 2         |           | 2         |           | 65     |
| Or one in . . . . .                                          | ...                                     | 5.22      |           | 3.31      |           | 4.90      |           | 7.75      |           | ...       |           | 10.00     |           | ...       |           |        |

From which it appears that the greatest number of deaths took place from Head diseases (Nervous system), namely, 97, of which 57 are recorded under the term "delirium tremens." The next in order are Disease of the liver, Dropsy, &c., and nearly the same number from Diseases of the respiratory organs. These results are rather curious, as shewing the very marked influence which intemperate habits have on the cause of death. Among the population of England and Wales, aged 20 and upwards, the deaths from Head diseases (Nervous System) constitute only 9.710 per cent. of the deaths from all causes at those ages; but among the intemperate classes they constitute 27.100 per cent., being nearly three times as great. With other diseases, similar differences will be found. In the general community, the deaths from Diseases of the respiratory organs, at the same periods of life, amount to 33.150 per cent. of the deaths from all causes; while among the intemperate group they are only 22.980 per cent. of all the deaths. The following figures exhibit these relations for England and Wales, for the Gotha Life Office, the "Scottish Widows' Fund" and the "Standard Assurance Company," (the last three being select classes, the details of which will be found in the preceding contribution), and also for intemperate lives.



## ABSTRACT C.

*Ratio per Cent. of Deaths, at ages 20 and upwards, from different causes, to the Total Deaths, from all causes, at the corresponding ages, in*

| Cause of Death.                  | England and Wales, 1847. | Gotha Life Office. 1839-49. | Scottish Widows' Fund. 1815-52. | Standard Life Office. 1846-50. | Intemperate Lives. |
|----------------------------------|--------------------------|-----------------------------|---------------------------------|--------------------------------|--------------------|
| Head diseases . . . . .          | 9·710                    | 15·176                      | 21·246                          | 18·089                         | 27·10              |
| Digestive organs . . . . .       | 6·240                    | 8·377                       | 12·838                          | 11·945                         | 23·30              |
| Respiratory organs . . . . .     | 33·150                   | 27·843                      | 21·096                          | 22·867                         | 22·98              |
| Total of the above three classes | 49·100                   | 51·396                      | 55·180                          | 52·901                         | 73·38              |

In England and Wales, the above three groups of diseases constitute 49·100 per cent. of the whole deaths; but in the intemperate class of lives they form 73·38 per cent. The most remarkable peculiarity in this respect is, however, the excessive development among intemperate persons of diseases of the Nervous system and of the Digestive organs. In England and Wales, these two groups form 15·950 per cent. of the deaths from all causes at the corresponding ages; but amongst intemperate persons, they form 50·40 per cent. of all the deaths which take place, or more than three times the general average. These may, therefore, be regarded as the distinctive type of the causes of death among intemperate persons; and the predominance of deaths assigned to such causes in any particular collection of facts, may fairly, in the absence of other and more direct evidence, lead to the inference of irregularity of habits having prevailed to an unusual extent. An inspection of the results given for the "Scottish Widows' Fund" immediately strikes the attention with the marked characteristics of this circumstance; there is an excess of the diseases of the Nervous system and Digestive organs, and a diminution of those of the Respiratory organs, being the same features, although not developed in so marked a degree, which are observable in the decidedly intemperate group of lives. The following shews that the results for the "Standard Life Office," but more particularly for the "Scottish Widows' Fund," hold something like an intermediate place between those for England and Wales generally, and the "intemperate group:"—

## ABSTRACT D.

| Group of Facts.                 | Ratio per Cent. to Total Deaths of Deaths from Diseases of the |                     |
|---------------------------------|----------------------------------------------------------------|---------------------|
|                                 | Nervous System and Digestive Organs.                           | Respiratory Organs. |
| England and Wales . . . . .     | 15·950 per cent.                                               | 33·150 per cent.    |
| Standard Life Office . . . . .  | 30·034 ...                                                     | 22·867 ...          |
| Scottish Widows' Fund . . . . . | 34·084 ...                                                     | 21·096 ...          |
| Intemperate Lives . . . . .     | 50·400 ...                                                     | 22·980 ...          |



Dr. Begbie, in his interesting report on the mortality of the "Scottish Widows' Fund," although alluding to the fact that several of the persons who died from diseases of the digestive organs were reported "free livers," still seems not to have been impressed with the remarkably high ratio of deaths from this cause in the materials before him: and the same observation applies to Professor Christison's paper.

It has been said that the returns of the Registrar-General do not afford the means of determining the number of deaths which take place in this country from the use of intoxicating drinks; but if viewed in connection with the data brought forward in this paper, it is obvious that a means is now supplied of making a near approximation to the results required: and, with this view, attention is directed to the following Table:—

TABLE VI.

*Deaths in England and Wales, 1847, from*

| Age.      | Delirium Tremens. |          |       | Intemperance. |          |       | Both.  |          |       | All Causes. |          |         |
|-----------|-------------------|----------|-------|---------------|----------|-------|--------|----------|-------|-------------|----------|---------|
|           | Males.            | Females. | Both. | Males.        | Females. | Both. | Males. | Females. | Both. | Males.      | Females. | Both.   |
| 16 to 20  | 2                 | ...      | 2     | 5             | ...      | 5     | 7      | ...      | 7     | 6,615       | 7,126    | 13,741  |
| 21 ... 30 | 59                | 9        | 68    | 23            | 12       | 35    | 82     | 21       | 103   | 15,457      | 16,514   | 31,971  |
| 31 ... 40 | 153               | 13       | 166   | 39            | 17       | 56    | 192    | 30       | 222   | 13,459      | 15,010   | 28,469  |
| 41 ... 50 | 131               | 18       | 149   | 46            | 17       | 63    | 177    | 35       | 212   | 14,044      | 13,379   | 27,423  |
| 51 ... 60 | 43                | 4        | 47    | 43            | 17       | 60    | 86     | 21       | 107   | 14,596      | 13,666   | 28,262  |
| 61 ... 70 | 26                | 6        | 32    | 23            | 6        | 29    | 49     | 12       | 61    | 17,923      | 18,048   | 35,971  |
| 71 ... 80 | 9                 | 1        | 10    | 5             | 1        | 6     | 14     | 2        | 16    | 19,292      | 21,334   | 40,626  |
| 81 ... 90 | 1                 | 1        | 2     | ...           | 1        | 1     | 1      | 2        | 3     | 10,138      | 12,179   | 22,317  |
|           | 424               | 52       | 476   | 184           | 71       | 255   | 608    | 123      | 731   | 111,524     | 117,256  | 228,780 |

The deaths recorded "delirium tremens" and "intemperance," as will be seen on referring to Abstract B, preceding, constitute but a small portion of the total deaths taking place among persons addicted to intemperate habits; and the following Table is prepared to shew the rate of mortality for each sex and term of life in England and Wales from those two specified causes:—



TABLE VII.

| MALES.    |                                                    |                                                                |                                                                                               |                                     |                               |                     |
|-----------|----------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------|---------------------|
| Age.      | Log. of Annual Rate of Increase of Population. (1) | $6 \times (1) \quad (2)$<br>$\lambda$ Population in 1841 } (3) | Population in 1847.<br>Number Dying $\times 100$ from Delirium Tremens and Intemperance. (4). | $(2) + (3)$<br>$\lambda (4)$        | $\lambda$ Mortality per Cent. | Mortality per Cent. |
| 16 to 20  | 0.0065216                                          | 0.0391296                                                      | 854,600                                                                                       | 5.9317623                           | 6.9133257                     | .00082              |
| 21 ... 30 | .0095741                                           | 5.8926327<br>.0574446                                          | 700<br>1,521,610                                                                              | 2.8450980<br>6.1823033              | 7.7315106                     | .00539              |
| 31 ... 40 | .0085533                                           | 6.1248587<br>.0513198                                          | 8,200<br>1,124,308                                                                            | 3.9138139<br>6.0508853              | 8.2324159                     | .01708              |
| 41 ... 50 | .0067954                                           | 5.9995655<br>.0407724                                          | 19,200<br>822,161                                                                             | 4.2833012<br>5.9149567              | 8.3330166                     | .02153              |
| 51 ... 60 | .0053307                                           | .8741843<br>.0319842                                           | 17,700<br>534,419                                                                             | 4.2479733<br>5.7278816              | 8.2066169                     | .01609              |
| 61 ... 70 | .0044890                                           | .6958974<br>.0269340                                           | 8,600<br>350,649                                                                              | 3.9344985<br>5.5448725              | 8.1453236                     | .01397              |
| 71 ... 80 | .0043558                                           | .5179385<br>.0261348                                           | 4,900<br>169,447                                                                              | 3.6901961<br>5.2290339              | 7.9170941                     | .00826              |
| 81 ... 90 | 0.0044547                                          | 5.2028995<br>0.0267282<br>4.6151501                            | 1,400<br>43,841<br>100                                                                        | 3.1461280<br>4.6418783<br>2.0000000 | 7.3581217                     | .00228              |
| FEMALES.  |                                                    |                                                                |                                                                                               |                                     |                               |                     |
| 16 ... 20 | 0.0059608                                          | 0.0357648                                                      | 874,197                                                                                       | 5.9416092                           | ...                           | ...                 |
| 21 ... 30 | .0081530                                           | 5.9058444<br>.0489180                                          | ...                                                                                           | ...                                 | 7.0975718                     | .00125              |
| 31 ... 40 | .0075728                                           | 6.1757295<br>.0454368                                          | 2,100<br>1,167,477                                                                            | 3.3222193<br>6.0672482              | 7.4098731                     | .00257              |
| 41 ... 50 | .0066544                                           | 6.0218114<br>.0399264                                          | 3,000<br>852,367                                                                              | 3.4771213<br>5.9306268              | 7.6134412                     | .00411              |
| 51 ... 60 | .0059566                                           | 5.8907004<br>.0357396                                          | 3,500<br>574,672                                                                              | 3.5440680<br>5.7594202              | 7.5627991                     | .00365              |
| 61 ... 70 | .0056652                                           | .7236806<br>.0339912                                           | 2,100<br>399,580                                                                              | 3.3222193<br>5.6016033              | 7.4775779                     | .00300              |
| 71 ... 80 | .0056223                                           | .5676121<br>.0337338                                           | 1,200<br>199,368                                                                              | 3.0791812<br>5.2996548              | 7.0013752                     | .00100              |
| 81 ... 90 | 0.0053864                                          | 5.2659210<br>0.0323184<br>4.7256176                            | 200<br>57,271<br>200                                                                          | 2.3010300<br>4.7579360<br>2.3010300 | 7.5430940                     | .00349              |

The following Abstract of this Table shews the relation of mortality in the sexes from those causes:—viz. when “delirium tremens,” or “intemperance” is recorded as the immediate cause of death.

ABSTRACT E.

| Age.      | Mortality per Cent. from Delirium Tremens and specified Intemperance, amongst |                |                                             |
|-----------|-------------------------------------------------------------------------------|----------------|---------------------------------------------|
|           | Males, 1847.                                                                  | Females, 1847. | Ratio of the Mortality of Females to Males. |
| 21 to 30  | .00539                                                                        | .00125         | 23 per cent.                                |
| 31 ... 40 | .01708                                                                        | .00257         | 15 ...                                      |
| 41 ... 50 | .02153                                                                        | .00411         | 19 ...                                      |
| 51 ... 60 | .01609                                                                        | .00365         | 23 ...                                      |
| 61 ... 70 | .01397                                                                        | .00300         | 22 ...                                      |
| 71 ... 80 | .00826                                                                        | .00100         | 12 ...                                      |



The figures in the last column shew that the mortality of the female sex is, on an average, about one-fifth of that of the males, varying from 23 per cent. at age 21-30, to 12 per cent. at age 71-80. It will likewise be seen that the maximum rate of mortality in both sexes is at the term of life 41-50 gradually increasing from the younger ages to that period, and then decreasing to the more advanced ages. The above rate of mortality must not be confounded with that given in Abstract A, which shewed, as is usual in tables of mortality, an increasing rate from the younger to the older ages. There is an important distinction between the two classes of facts. Abstract A shews the rate of mortality among a class of people all of whom have indulged in the immoderate use of intoxicating drinks, while the facts given immediately above shew the proportion of deaths from certain forms of intemperance in the community generally at the respective terms of life; and although it be true that the rate of mortality is higher in the decade 41-50, it is not to be inferred that intemperate habits have the most detrimental effect on the constitution at those ages, for Abstract A proves that as age increases, the baneful influence on health of strong drinks also increases; the legitimate inference to be drawn is, simply, that drinking habits are more prevalent at that term of life than at any other; in fact, the figures just given demonstrate that the folly of indulging in the intemperate use of strong drinks grows on the community from youth to the mature period of manhood, 41-50 years of age, after which time the man gets sobered into the more limited use of them, avoiding the excesses of earlier years.

But perhaps the most curious circumstance disclosed by the above figures is the remarkable similarity between the proportion of crime in the sexes to the proportion of deaths from assigned causes of intemperance. By referring to a subsequent contribution shewing the influence of age on the development of crime, it will be found that the tendency to crime in the male sex is nearly five times as great as in the female sex, or, more strictly, in the relation of 336 to 1581; while the ratio of deaths to the population from assigned intemperate causes, at age 20 and upwards, are in the exact relation 8011 to 36,769, a most remarkable agreement, the difference being under 2.5 per cent.; 7814 substituted for 8011 would give the precise relation of the figures shewing the tendency of crime in the sexes. This is rather a strange coincidence, to be hereafter referred to more in detail; and may be probably viewed by most careful observers as proving that crime legally considered, and intemperance in its ordinary acceptation, are the concomitants of each other.

So far the deaths from intemperate habits have been spoken of in regard to the general population of England and Wales, as recorded under assigned causes in the reports of the Registrar-General; but it must be evident that the deaths actually occasioned, or, at all events, hastened, by extreme indulgence in intoxicating liquors, far exceeds those nominally recorded in the official returns as proceeding from this cause. This is satisfactorily proved by the facts in Table V and Abstract B. And, assuming that in the country generally the deaths in the Registrar-General's returns from intemperance would bear the



same relation to those under assigned causes, which the more careful observation of the facts analysed in Abstract B shews, it becomes a very easy matter to determine the number and ratio of deaths which actually take place among intemperate persons in England and Wales. On this hypothesis the following Table has been constructed: the numbers in the second and sixth columns consist of the product of the numbers in the lowest horizontal line of Abstract B, page 221, and the numbers for the corresponding ages in columns 8 and 9 of Table VI, page 223.

TABLE VIII.  
*Intemperance—England and Wales, 1847.*

| Age.              | MALES.                              |                                                           |                                     |                                 | FEMALES.                            |                                                           |           |                     |
|-------------------|-------------------------------------|-----------------------------------------------------------|-------------------------------------|---------------------------------|-------------------------------------|-----------------------------------------------------------|-----------|---------------------|
|                   | Number Dying from Intemperance. (1) | $\lambda((1) \times 100)(2)$<br>$\lambda$ Population. (3) | (2) — (3).                          | Mortality per Cent.             | Number Dying from Intemperance. (1) | $\lambda((1) \times 100)(2)$<br>$\lambda$ Population. (3) | (2) — (3) | Mortality per Cent. |
| 21 to 30          | 428                                 | 4.6314438                                                 | 8.4491405                           | .0281                           | 110                                 | 4.0413927                                                 | 7.8167452 | .0066               |
| 31 ... 40         | 646                                 | 6.1823033                                                 | 8.7593472                           | .0575                           | 99                                  | 6.2246475                                                 | 7.9283870 | .0085               |
| 41 ... 50         | 867                                 | 4.8102325                                                 | 9.0230624                           | .1055                           | 172                                 | 3.9956352                                                 | 8.3049016 | .0202               |
| 51 ... 60         | 663                                 | 6.0508853                                                 | 9.0955926                           | .1246                           | 163                                 | 4.2355284                                                 | 8.4527674 | .0284               |
| 61 ... 70         | 435                                 | 4.9380191                                                 | 9.0936168                           | .1241                           | 107                                 | 5.9306268                                                 | 8.4277805 | .0268               |
| 71 ... 80         | 140                                 | 5.7278816                                                 | 8.9170941                           | .0826                           | 20                                  | 4.2121876                                                 | 8.0013752 | .0100               |
|                   | 3,182                               | 5.5448725                                                 |                                     |                                 | 671                                 | 4.0293838                                                 |           |                     |
|                   |                                     | 4.1461280                                                 |                                     |                                 |                                     | 5.6016033                                                 |           |                     |
|                   |                                     | 5.2290339                                                 |                                     |                                 |                                     | 3.3010300                                                 |           |                     |
|                   |                                     |                                                           |                                     |                                 |                                     | 5.2996548                                                 |           |                     |
| MALES AND FEMALES |                                     |                                                           |                                     |                                 |                                     |                                                           |           |                     |
| Age.              | Population, Males. (1)              | Population, Females. (2)                                  | Number Lying from Intemperance. (3) | $\lambda((3) \times 100)$ . (5) | (5) — (6).                          | Mortality per Cent.                                       |           |                     |
|                   |                                     |                                                           | (1) + (2). (4)                      | $\lambda$ Population. (6)       |                                     |                                                           |           |                     |
| 21 to 30          | 1,521,610                           |                                                           | 538                                 | 4.7307823                       | 8.2257590                           | .0168                                                     |           |                     |
| 31 ... 40         | 1,677,442                           |                                                           | 3,199,052                           | 6.5050233                       | .5119824                            | .0325                                                     |           |                     |
| 41 ... 50         | 1,124,308                           |                                                           | 745                                 | 4.8721563                       | .7927230                            | .0620                                                     |           |                     |
| 51 ... 60         | 1,167,477                           |                                                           | 2,291,785                           | 6.3601739                       | .8735874                            | .0747                                                     |           |                     |
| 61 ... 70         | 822,161                             |                                                           | 1,039                               | 5.0166155                       | .8588055                            | .0722                                                     |           |                     |
| 71 ... 80         | 852,367                             |                                                           | 1,674,528                           | 6.2238925                       | 8.6373114                           | .0434                                                     |           |                     |
|                   | 534,419                             |                                                           | 829                                 | 4.9185545                       |                                     |                                                           |           |                     |
|                   | 574,672                             |                                                           | 1,109,091                           | 6.0449671                       |                                     |                                                           |           |                     |
|                   | 350,649                             |                                                           | 542                                 | 4.7339993                       |                                     |                                                           |           |                     |
|                   | 399,580                             |                                                           | 750,229                             | 5.8751938                       |                                     |                                                           |           |                     |
|                   | 169,447                             |                                                           | 160                                 | 4.2041200                       |                                     |                                                           |           |                     |
|                   | 199,368                             |                                                           | 368,815                             | 5.5668086                       |                                     |                                                           |           |                     |

In the above results, shewing the ratio of deaths as resulting from all intemperate causes, it will be observed that the maximum mortality takes place ten years later in life than in the results given in Table VII, and subsequent Abstract. This difference is due to the reduced ratio of deaths from delirium tremens at ages 51–60, in Abstract B; but,



notwithstanding this, it will be found that the relation of mortality in the male and female population is nearly as 5 to 1;—being as 7259 to 1421.

The following Table exhibits the rate of mortality in the whole population of England and Wales for the year 1847, being the period to which the facts already discussed in regard to intemperance relate. In page 4, *ante* Table B, will be found the rate of mortality for England and Wales for the years 1838–41, and a comparison will shew the increased mortality in the more recent year to be very considerable:—

TABLE IX.

*All Causes—England and Wales, 1847.*

| Age.      | MALES.                            |                                                           |            |                     | FEMALES.                          |                                                           |            |                     |
|-----------|-----------------------------------|-----------------------------------------------------------|------------|---------------------|-----------------------------------|-----------------------------------------------------------|------------|---------------------|
|           | Number dying from all Causes. (1) | $\lambda((1) \times 100)(2)$<br>$\lambda$ Population. (3) | (2) — (3). | Mortality per Cent. | Number dying from all Causes. (1) | $\lambda((1) \times 100)(2)$<br>$\lambda$ Population. (3) | (2) — (3). | Mortality per Cent. |
| 21 to 30  | 15,457                            | 6.1891252                                                 | 0.0068219  | 1.016               | 16,514                            | 6.2178523                                                 | 9.9932048  | .984                |
| 31 ... 40 | 13,459                            | 6.1823033                                                 | .0781275   | 1.197               | 15,010                            | 6.2246475                                                 | 0.1091325  | 1.286               |
| 41 ... 50 | 14,044                            | 6.1290128                                                 | .0508853   | 1.708               | 13,379                            | 6.1763807                                                 | 0.1957969  | 1.570               |
| 51 ... 60 | 14,596                            | 6.1474908                                                 | .2325341   | 2.731               | 13,666                            | 6.0672482                                                 | 0.3762212  | 2.378               |
| 61 ... 70 | 17,923                            | 5.9149567                                                 | .4363523   | 5.111               | 18,048                            | 5.9306268                                                 | 0.6548258  | 4.517               |
| 71 ... 80 | 19,292                            | 6.1642339                                                 | 1.0563434  | 11.385              | 21,334                            | 6.1356414                                                 | 1.0294175  | 10.701              |
|           | 94,771                            | 5.7278816                                                 |            |                     | 97,951                            | 5.7594202                                                 |            |                     |
|           |                                   | 6.2534107                                                 |            |                     |                                   | 6.2564291                                                 |            |                     |
|           |                                   | 5.5448725                                                 |            |                     |                                   | 5.6016033                                                 |            |                     |
|           |                                   | 6.2853773                                                 |            |                     |                                   | 6.3290723                                                 |            |                     |
|           |                                   | 5.2290339                                                 |            |                     |                                   | 5.2996548                                                 |            |                     |

The following Abstract gives the relation of the rate of mortality from intemperance to that from all causes for different terms of life:—

| Age.      | Mortality per Cent. from |          |               |          | Ratio of the Deaths from Intemperance to those from all causes. |                   |                   |                   |
|-----------|--------------------------|----------|---------------|----------|-----------------------------------------------------------------|-------------------|-------------------|-------------------|
|           | All Causes, 1847.        |          | Intemperance. |          | Males.                                                          |                   | Females.          |                   |
|           | Males.                   | Females. | Males.        | Females. | Per Cent. or 1 in                                               | Per Cent. or 1 in | Per Cent. or 1 in | Per Cent. or 1 in |
| 21 ... 30 | 1.016                    | .984     | .0281         | .0066    | 2.8 36                                                          | .7 149            |                   |                   |
| 31 ... 40 | 1.197                    | 1.286    | .0575         | .0085    | 4.8 21                                                          | .7 151            |                   |                   |
| 41 ... 50 | 1.708                    | 1.570    | .1055         | .0202    | 6.2 16                                                          | 1.3 78            |                   |                   |
| 51 ... 60 | 2.731                    | 2.378    | .1246         | .0284    | 4.5 22                                                          | 1.2 84            |                   |                   |
| 61 ... 70 | 5.111                    | 4.517    | .1241         | .0268    | 2.4 41                                                          | .6 168            |                   |                   |
| 71 ... 80 | 11.385                   | 10.701   | .0826         | .0100    | .7 138                                                          | .09 1,070         |                   |                   |

From the figures in columns 2 and 6 of Table VIII, it will be seen that, among persons addicted to decidedly intoxicating habits, 3182 males and 671 females die yearly, or 3853 of both sexes. This is strangely at variance with the statements put forth by some of the reformation societies, which make the number to be 50,000 yearly, or



upwards of one in 4 of the whole deaths at the corresponding ages of the deaths from all causes.

As the process is a simple one, it may be interesting before concluding this paper to make an estimate of the persons of each sex in England and Wales who are addicted to such habits of intemperance as will ultimately bring them within the preceding catalogue of deaths. If

$\delta$  = the number of deaths yearly taking place from intemperance in the corrected results of the returns of the Registrar-General, as given in Table VIII; and

$\pi$  = the mortality per cent. among persons of known intemperate habits, as given in Abstract A, page 204;

then  $\frac{100\delta}{\pi}$  = the existing number of drunkards, or persons given to extreme drinking usages.

On this principle, the following Table has been constructed:—

TABLE X.  
*England and Wales, 1847.*

| Age.      | MALES.                                  |                                 |            |        | Existing Number of Drunkards. |
|-----------|-----------------------------------------|---------------------------------|------------|--------|-------------------------------|
|           | Number of Deaths from Intemperance. (1) | $\lambda ((1) \times 100). (3)$ | (3) — (4). |        |                               |
|           | Mortality per Cent. (2)                 | $\lambda (2). (4)$              |            |        |                               |
| 21 to 30  | 428                                     | 4.6314438                       | 3.9365755  | 8,641  |                               |
|           | 4.953                                   | 0.6948683                       |            |        |                               |
| 31 ... 40 | 646                                     | 4.8102325                       | 4.1455905  | 13,983 |                               |
|           | 4.620                                   | 0.6646420                       |            |        |                               |
| 41 ... 50 | 867                                     | 4.9380191                       | 4.1604473  | 14,469 |                               |
|           | 5.992                                   | 0.7775718                       |            |        |                               |
| 51 ... 60 | 666                                     | 4.8234742                       | 4.0160745  | 10,377 |                               |
|           | 6.418                                   | 0.8073997                       |            |        |                               |
| 61 ... 70 | 435                                     | 4.6384893                       | 3.7358338  | 5,443  |                               |
|           | 7.992                                   | 0.9026555                       |            |        |                               |
| 71 ... 80 | 140                                     | 4.1461280                       | 2.8864863  | 670    |                               |
|           | 18.182                                  | 1.2596417                       |            |        |                               |
|           |                                         |                                 |            | 53,583 |                               |

| Age.      | FEMALES.                                |                                 |            |                               | MALES AND FEMALES.            |
|-----------|-----------------------------------------|---------------------------------|------------|-------------------------------|-------------------------------|
|           | Number of Deaths from Intemperance. (1) | $\lambda ((1) \times 100). (3)$ | (3) — (4). | Existing Number of Drunkards. | Existing Number of Drunkards. |
|           | Mortality per Cent. (2)                 | $\lambda (2). (4)$              |            |                               |                               |
| 21 to 30  | 110                                     | 4.0413927                       | 3.3465244  | 2,221                         | 10,862                        |
|           | 4.953                                   | 0.6948683                       |            |                               |                               |
| 31 ... 40 | 99                                      | 3.9956352                       | 3.3309932  | 2,143                         | 16,126                        |
|           | 4.620                                   | 0.6646420                       |            |                               |                               |
| 41 ... 50 | 172                                     | 4.2355284                       | 3.4579566  | 2,870                         | 17,339                        |
|           | 5.992                                   | 0.7775718                       |            |                               |                               |
| 51 ... 60 | 163                                     | 4.2121876                       | 3.4047879  | 2,540                         | 12,917                        |
|           | 6.418                                   | 0.8073997                       |            |                               |                               |
| 61 ... 70 | 107                                     | 4.0293838                       | 3.1267283  | 1,339                         | 6,782                         |
|           | 7.992                                   | 0.9026555                       |            |                               |                               |
| 71 ... 80 | 20                                      | 3.3010300                       | 2.0413883  | 110                           | 780                           |
|           | 18.182                                  | 1.2596417                       |            |                               |                               |
|           |                                         |                                 |            | 11,223                        | 64,806                        |



From which it appears that the number of

drunkards is { Males . . 53,583  
Females . 11,223  
Total . 64,806

which gives one drunkard to every 74 of the male population,

one ... 434 of the female population,

and one ... 145 of both sexes above the age of 20.

On the same principle the following gives the ratio of drunkards at each term of life:—

TABLE XI.

| Age.      | MALES.               |            |                                      |         | FEMALES.             |            |                                      |         |
|-----------|----------------------|------------|--------------------------------------|---------|----------------------|------------|--------------------------------------|---------|
|           | Population,<br>1847. | Drunkards. | Ratio of Drunkards<br>to Population. |         | Population,<br>1847. | Drunkards. | Ratio of Drunkards<br>to Population. |         |
|           |                      |            | Per Cent.                            | or 1 in |                      |            | Per Cent.                            | or 1 in |
| 21 to 30  | 1,521,610            | 8,641      | ·57                                  | 176     | 1,677,442            | 2,221      | ·13                                  | 755     |
| 31 ... 40 | 1,124,308            | 13,983     | 1·25                                 | 80      | 1,167,477            | 2,143      | ·18                                  | 545     |
| 41 ... 50 | 822,161              | 14,469     | 1·75                                 | 57      | 852,367              | 2,870      | ·34                                  | 297     |
| 51 ... 60 | 534,419              | 10,377     | 1·92                                 | 52      | 574,672              | 2,540      | ·44                                  | 226     |
| 61 ... 70 | 350,649              | 5,443      | 1·56                                 | 64      | 399,580              | 1,339      | ·34                                  | 298     |
| 71 ... 80 | 169,447              | 670        | ·40                                  | 253     | 199,368              | 110        | ·055                                 | 1,812   |

On giving close attention to the principles on which the two preceding Tables are constructed, it must be evident that the figures therein determined simply represent the class of persons in England and Wales who are included in the description given in the concluding paragraph of page 202 *ante*, and the numbers above are therefore not applicable to any other test of what constitutes Intemperance. No doubt there are many persons who will be found to maintain that the number of drunkards must be much greater than has been deduced in the foregoing calculations, but on reflection it will be found impossible for them to do so unless by the adoption of a much more severe test than it was thought proper to adopt for the purpose of this inquiry.

It is hoped that the facts contained in this Contribution may throw some light on a question not hitherto investigated statistically; and that while they point out to assurance offices, and other companies trading in pecuniary adventures on life, the perilous nature of such risks when connected with the lives of intemperate persons, and the urgent necessity for a high rate of premium, they will also not be without valuable influence on the social, political, and religious condition of society.



## ANALYTICAL VIEW

OF

## RAILWAY ACCIDENTS.

The unusual degree of public attention recently directed to the nature, cause, and extent of railway accidents, has induced me to submit the present paper to the consideration of the public. The vital importance of the railway system to the commercial and social interest of this country, and its rapidly increasing magnitude, threatening to absorb every other means of intercommunication, render an investigation into the causes of accidents in railway traffic, and their effect on the loss of life and limb, one of no ordinary importance.

In order to accomplish as complete an analysis as possible of what will immediately appear to be a very complicated question, there has been embraced in the present inquiry the whole of the information contained in the documents issued by the Railway Department of the Board of Trade, from the 7th of August, 1840, until the most recent return, which brings the results down to the 1st of January, 1853.

Before entering into the inquiry as to the nature of accidents, it will be necessary to understand the extent of railway communication, and the degree to which the public have availed themselves of it.

The following Table shews the number of miles open for traffic at various dates since the month of August, 1840:—



TABLE I.

| DATE.               | Miles open to Traffic. | Periodical Increase of Railway Communication. |
|---------------------|------------------------|-----------------------------------------------|
| August, 1840        | 1,330                  | Miles                                         |
| 31st December, 1840 | 1,556                  | 226 (increase of 5 months).                   |
| ... 1841            | 1,717                  | 161 (increase of 1 year).                     |
| ... 1842            | 1,857                  | 140 ...                                       |
| ... 1843            | 1,952                  | 95 ...                                        |
| ... 1844            | 2,148                  | 196 ...                                       |
| 30th June 1845      | 2,343                  | 195 (half-yearly).                            |
| ... 1846            | 2,765                  | 422 (increase of 1 year).                     |
| ... 1847            | 3,603                  | 838 ...                                       |
| ... 1848            | 4,478                  | 875 ...                                       |
| ... 1849            | 5,447                  | 969 ...                                       |
| ... 1850            | 6,308                  | 861 ...                                       |
| ... 1851            | 6,698                  | 390 ...                                       |
| ... 1852            | 7,076                  | 378 ...                                       |
| 31st December, 1852 | 7,336                  | 260 (half-yearly).                            |

From the third column of the above Table, it will be seen that the five years immediately succeeding the 30th of June, 1845, were a period of the greatest activity in the construction of railways, nearly 4000 miles having been opened for traffic in that time, or upwards of one-half of the whole extent of railway communication. The maximum extent of railway opened for traffic in any one year was in 1849; since then much less activity has prevailed, and the number of miles opened has gradually declined every year down to 1852. However satisfactory this activity and energy in developing the railway system may appear, it still contrasts very disadvantageously with the progress of our neighbours in the United States of America. From the seventh census, printed by order of the House of Representatives, it appears that

ABSTRACT A.

|                             | Number of Miles open to Traffic. | Number of Miles in Progress. | Total Miles. |
|-----------------------------|----------------------------------|------------------------------|--------------|
| On the 1st of January, 1852 | 10,843                           | 10,898                       | 21,741       |
| On the 1st of January, 1853 | 13,266                           | 12,681                       | 25,947       |
| Increase in 1 year          | 2,423                            | 1,783                        | 4,206        |

This active spirit of railway extension is not confined to one or two of the States; but appears to be, to a greater or less extent, characteristic of at least twenty-one of them.

The following Table contains a large amount of information on the extent of passenger traffic on the railways of this country; viz:—

- (a.) The average fare per mile for each class of passengers for each year since the 7th of August, 1840.
- (b.) The number of passengers of each class who travelled during each year.
- (c.) And the amount of money received for passenger traffic from each class during each year.



TABLE II.

| DATE.                            | Average Fare per Mile,<br>in Pence. |               |               |        | Number of Passengers. |            |            |                |               |            | Receipts in £ |            |                |              |                 |
|----------------------------------|-------------------------------------|---------------|---------------|--------|-----------------------|------------|------------|----------------|---------------|------------|---------------|------------|----------------|--------------|-----------------|
|                                  | 1st<br>Class.                       | 2nd<br>Class. | 3rd<br>Class. | Parly. | 1st Class.            | 2nd Class. | 3rd Class. | Parliamentary. | All Classes.* | 1st Class. | 2nd Class.    | 3rd Class. | Parliamentary. | All Classes. | Totals          |
|                                  | 1st<br>Class.                       | 2nd<br>Class. | 3rd<br>Class. | Parly. | 1st Class.            | 2nd Class. | 3rd Class. | Parliamentary. | All Classes.* | 1st Class. | 2nd Class.    | 3rd Class. | Parliamentary. | All Classes. |                 |
| 7th August to<br>Dec. 31st, 1840 | 2-516                               | 1-826         | 1-297         | ...    | ...                   | ...        | ...        | ...            | 6,027,866     | ...        | ...           | ...        | ...            | 756,810      |                 |
| June 30th, 1841                  | 2-516                               | 1-826         | 1-297         | ...    | 1,530,040             | 4,144,169  | 2,357,745  | ...            | 9,122,816     | 281,088    | 231,046       | 68,515     | ...            | 1,145,386    |                 |
| ... 1842                         | 2-503                               | 1-803         | 1-249         | ...    | 2,926,980             | 7,611,966  | 5,332,501  | ...            | 19,000,000    | ...        | ...           | ...        | ...            | 2,970,000    |                 |
| ... 1843                         | 2-490                               | 1-780         | 1-201         | ...    | 4,276,540             | 11,198,512 | 6,431,911  | ...            | 23,466,896    | 1,374,942  | 1,288,758     | 411,382    | ...            | 3,110,257    |                 |
| Average Fare<br>of the 4 years   | 2-506                               | 1-809         | 1-261         | ...    | 8,733,560             | 22,954,647 | 14,122,157 | ...            | 57,617,578    |            |               |            |                | 7,982,453    | Totals          |
| June 30th, 1844                  | 2-349                               | 1-699         | 1-145         | ...    | 4,875,332             | 12,235,686 | 8,583,085  | ...            | 27,763,602    | 1,432,688  | 1,375,679     | 483,069    | ...            | 3,439,294    |                 |
| ... 1845                         | 2-212                               | 1-588         | 968           | ...    | 5,474,163             | 14,325,825 | 13,135,820 | ...            | 33,791,253    | 1,516,805  | 1,598,115     | 651,903    | ...            | 3,976,341    |                 |
| ... 1846                         | 2-008                               | 1-465         | 953           | 926    | 6,160,354             | 16,931,065 | 14,559,515 | 3,946,922      | 43,790,984    | 1,661,898  | 1,937,947     | 738,474    | 293,732        | 4,725,216    |                 |
| ... 1847                         | 2-046                               | 1-414         | 877           | 905    | 6,572,714             | 18,699,288 | 15,865,310 | 6,985,493      | 51,352,163    | 1,675,759  | 2,048,080     | 737,452    | 539,977        | 5,148,002    |                 |
| Average Fare<br>of the 4 years   | 2-143                               | 1-529         | 987           | 916    | 23,082,563            | 62,191,864 | 52,143,730 | 10,932,415     | 156,698,002   | 6,287,150  | 6,959,821     | 2,621,898  | 833,709        | 17,288,853   | Totals          |
| June 30th, 1848                  | 2-089                               | 1-695         | 953           | 939    | 7,190,779             | 21,690,510 | 15,241,529 | 13,092,489     | 57,965,070    | 1,792,533  | 2,352,153     | 661,038    | 902,851        | 5,720,382    |                 |
| ... 1849                         | 2-217                               | 1-614         | 982           | 952    | 7,078,690             | 23,392,450 | 14,378,376 | 15,432,457     | 60,398,159    | 1,889,646  | 2,502,588     | 651,366    | 1,059,786      | 6,105,975    |                 |
| ... 1850                         | 2-183                               | 1-584         | 951           | 933    | 7,734,728             | 24,226,668 | 15,547,749 | 19,249,974     | 66,840,175    | 1,969,247  | 2,594,817     | 688,407    | 1,211,634      | 6,465,576    |                 |
| ... 1851                         | 2-103                               | 1-531         | 929           | 913    | 9,175,781             | 28,933,044 | 16,990,073 | 23,820,723     | 78,969,623    | 2,212,799  | 2,847,469     | 714,480    | 1,402,593      | 7,177,341    |                 |
| Average Fare<br>of the 4 years   | 2-149                               | 1-568         | 953           | 933    | 31,179,978            | 98,242,672 | 62,157,727 | 71,595,643     | 264,173,027   | 7,864,225  | 10,297,027    | 2,715,291  | 4,576,864      | 25,469,274   | Totals          |
| June 30th, 1852                  | 2-126                               | 1-550         | 1-023         | 905    | 10,143,442            | 30,967,913 | 15,642,137 | 29,973,553     | 86,758,997    | 2,389,971  | 3,010,921     | 662,230    | 1,809,163      | 7,984,652    |                 |
| Dec. 31st, 1852                  | 2-035                               | 1-486         | 947           | 901    | 5,859,214             | 17,524,051 | 9,522,313  | 16,962,553     | 49,886,123    | 1,308,973  | 1,630,349     | 440,916    | 919,986        | 4,354,831    |                 |
|                                  |                                     |               |               |        |                       |            |            |                | 615,133,727   |            |               |            |                | 63,080,063   | Grand<br>Total. |

\* All Classes is not the total of the four preceding columns, but includes Mixed Trains, and also Holders of Periodical Tickets.



From the above Table it appears that, in the year ending the 30th June, 1842, the total number of passengers travelling by railways was 19,000,000; but in the year ending the 30th of June, 1852, just ten years after, the number of passengers was no less than 86,758,997, being an increase of about 357 per cent., while, in the same ten years, the number of miles of railway in operation had increased from 1787 miles to 7076 miles, being an increase of nearly 296 per cent., so that the passenger traffic has increased to a much greater extent than the lines of railway communication.

With respect to the revenue from passenger traffic on railways, it is remarkably curious to observe the fluctuations in the receipts from the different classes. The parliamentary trains cannot be considered to have been in proper operation prior to the years 1846-7; and since then the following very striking fluctuations in the passenger traffic of each class manifests itself:—

## ABSTRACT B.

| In the Year ending the                                           | The Number of Passengers by the |                |                 |                      |
|------------------------------------------------------------------|---------------------------------|----------------|-----------------|----------------------|
|                                                                  | First Class.                    | Second Class.  | Third Class.    | Parliamentary Class. |
| 30th June, 1847 . . . . .                                        | 6,572,714                       | 18,699,288     | 15,865,310      | 6,985,493            |
| 30th June, 1852 . . . . .                                        | 10,143,442                      | 30,967,913     | 15,642,137      | 29,973,553           |
| Increase of Traffic per annum }<br>in the above five years . . } | 3,570,728                       | 12,268,625     | — 223,173       | 22,988,060           |
| Or, an Increase in each Class of                                 | 54·3 per cent.                  | 65·6 per cent. | — 1·4 per cent. | 329·1 per cent.      |

It thus appears that, while there has been a pretty uniform rate of increase in the first and second classes, of 54·3 per cent. and 65·6 per cent. respectively, there has been actually a slight decrease in the number of passengers travelling by the third class carriages; in fact, it will be seen from the figures in Table II preceding, that ever since the year 1846, the number of passengers travelling by third class carriages has been very uniform, notwithstanding that the line of railway communication has since then increased 156 per cent., the greatest number, in any one year, being 16,990,073, in 1851, and the least being 14,378,376, in 1849; but, viewed in connection with this, will be seen the wonderful increase in the number of persons travelling by the parliamentary trains: ranging from 6,985,493, in 1847, to no less than 29,973,553, in the year 1852, being an augmentation of 329·1 per cent. This very remarkable result in the increase of passengers by the parliamentary trains will be hereafter referred to; but it is now necessary to direct attention to the receipts from each of these classes.



## ABSTRACT C.

| In the Year ending the                                    | Receipts from the |                |                 |                      |
|-----------------------------------------------------------|-------------------|----------------|-----------------|----------------------|
|                                                           | First Class.      | Second Class.  | Third Class.    | Parliamentary Class. |
| 30th June, 1847 .....                                     | £<br>1,675,759    | £<br>2,048,080 | £<br>737,452    | £<br>539,977         |
| 30th June, 1852 .....                                     | 2,389,971         | 3,010,921      | 662,230         | 1,809,163            |
| Increase of Receipts yearly<br>in the above 4 years ..... | 714,212           | 962,841        | —75,222         | 1,269,186            |
| Or, an Increase in each<br>Class of .....                 | 42·7 per Cent.    | 47·0 per Cent. | —10·2 per Cent. | 235·00 per Cent.     |

These results follow in somewhat the same order as those deduced in Abstract B, with regard to the number of passengers; but a further abstract of the facts furnished in Table II, is calculated to throw some additional light on the increase of receipts in recent years from the parliamentary trains.

## ABSTRACT D.

| During the Years | Average Fare per Mile, in Pence. |               |              |                      |
|------------------|----------------------------------|---------------|--------------|----------------------|
|                  | First Class.                     | Second Class. | Third Class. | Parliamentary Class. |
| 1840—43          | 2·506                            | 1·809         | 1·261        |                      |
| 1844             | 2·349                            | 1·699         | 1·145        |                      |
| 1845             | 2·212                            | 1·588         | ·968         |                      |
| 1846             | 2·008                            | 1·465         | ·953         | ·926                 |
| 1847             | 2·046                            | 1·414         | ·877         | ·905                 |
| 1848             | 2·089                            | 1·695         | ·953         | ·939                 |
| 1849             | 2·217                            | 1·614         | ·982         | ·952                 |
| 1850             | 2·183                            | 1·584         | ·951         | ·933                 |
| 1851             | 2·103                            | 1·531         | ·929         | ·913                 |
| 1852             | 2·126                            | 1·550         | 1·023        | ·905                 |

From this Abstract it will be seen that, in the first and second classes, the minimum rate of fares was charged in the years 1846–7, until which period the scale of charges pretty uniformly and gradually decreased; but since then they have fluctuated at considerably higher prices, and have recently shewn a very decided tendency to increase.

It may be interesting to observe in this place, the difference in the rates of fares charged in different parts of the kingdom. The form of the returns of the railway department do not admit of this being done prior to the year 1850; and the following figures embrace, therefore, only the three years 1850–2:—



| Place.              | Average Fare per Mile during 1850—52, in Pence. |               |              |                      |
|---------------------|-------------------------------------------------|---------------|--------------|----------------------|
|                     | First Class.                                    | Second Class. | Third Class. | Parliamentary Class. |
| England and Wales . | 2·257                                           | 1·567         | 0·983        | ·916                 |
| Scotland . . . . .  | 2·022                                           | 1·565         | 1·120        | ·936                 |
| Ireland . . . . .   | 1·698                                           | 1·298         | 0·751        | ·844                 |

These results are calculated to throw some light on this branch of railway management. In Ireland, it will be seen, the fares are for every class less than in either England or Scotland. What is also worthy of remark is, the fact that in Ireland the fares for every class of passengers have, during the above three years, been uniformly decreasing, the rates, in 1852, being about 5 per cent. less in the first, and 8 per cent. less in the parliamentary class than they were in 1850. In Scotland, on the other hand, there has, in the same period, been a decided increase of fares in every class; while in England the fares in the second and third classes only, have increased. If the object of this paper admitted of an extension of this part of the inquiry, it would be important to trace the connection of cheap fares and the fluctuations in the passenger traffic. The scale of fares on the Scotch lines is very peculiar. The first-class fares are intermediate between those for England and Ireland; the second class almost precisely the same as on the English lines, but quite 20 per cent. higher than those on the Irish lines; the third class fares are 14 per cent. above the English, and 49 per cent. above those of the Irish lines; and the parliamentary trains charge fares 2 per cent. above those of the English, and 11 per cent. above those of the Irish railways.

It is, however, in the parliamentary trains that the evident advantages and effects of cheap travelling are to be witnessed. Nothing can be more conclusive on this head than the facts contained in Abstracts B and C; for if any evidence were wanted of the adaptation of the railway system to the locomotive necessities of the population of this country, it is furnished in the magical effects which the cheap and convenient parliamentary trains, stopping at every station, have had on the amount of passenger traffic since the years 1846–7, and the consequent increase of revenue to railway companies. But the introduction of parliamentary trains shews a still more wonderful result on the passenger traffic of recent years, and of a character but very imperfectly understood even by those supposed to be giving attention to railway matters. This interesting feature will be seen in the following table, in which will be found for each year—

- (a.) The total mileage of each class of passengers, deduced from the data contained in Table II.
- (b.) The average distance, or number of miles, travelled by passengers in each class; also
- (c.) The average distance travelled by all classes of passengers taken collectively; and,
- (d.) Finally, the total distance, or number of miles travelled in the aggregate by the whole of the passengers.



TABLE III.

| Date.     | Total Mileage of each Class. |               |              |                | Average Distance Travelled by Passengers in each Class. |               |              |                | Average Distance by each Passenger without distinction of Class. | Total Distance Travelled (or Mileage) by all the Passengers collectively. |
|-----------|------------------------------|---------------|--------------|----------------|---------------------------------------------------------|---------------|--------------|----------------|------------------------------------------------------------------|---------------------------------------------------------------------------|
|           | First Class.                 | Second Class. | Third Class. | Parliamentary. | First Class.                                            | Second Class. | Third Class. | Parliamentary. |                                                                  |                                                                           |
| 1840      | ..                           | ..            | ..           | ..             | ..                                                      | ..            | ..           | ..             | 17.5                                                             | 105,487,661                                                               |
| 1841      | 26,812,846                   | 30,367,492    | 12,678,180   | ..             | 17.5                                                    | 7.3           | 5.4          | ..             | 17.5                                                             | 159,649,280                                                               |
| 1842      | ..                           | ..            | ..           | ..             | ..                                                      | ..            | ..           | ..             | 17.5                                                             | 332,500,000                                                               |
| 1843      | 132,524,530                  | 173,765,124   | 82,207,893   | ..             | 30.9                                                    | 15.1          | 12.8         | ..             | 17.5                                                             | 410,670,680                                                               |
| Total ... |                              |               |              | ..             | ..                                                      | ..            | ..           | ..             | ..                                                               | 1,008,307,621                                                             |
| 1844      | 145,459,821                  | 194,327,816   | 101,254,638  | ..             | 29.8                                                    | 15.9          | 11.8         | ..             | 17.2                                                             | 477,533,954                                                               |
| 1845      | 119,364,014                  | 241,528,715   | 161,628,843  | ..             | 21.8                                                    | 16.9          | 12.3         | ..             | 15.9                                                             | 537,280,923                                                               |
| 1846      | 198,633,227                  | 317,479,372   | 185,975,614  | 76,129,244     | 32.3                                                    | 18.8          | 12.1         | 19.3           | 18.5                                                             | 810,133,204                                                               |
| 1847      | 196,667,722                  | 347,623,197   | 201,811,266  | 143,198,320    | 31.4                                                    | 18.6          | 12.7         | 20.5           | 18.7                                                             | 960,285,448                                                               |
| Total...  | 660,134,784                  | 1,100,959,100 | 650,670,361  | 219,327,564    | 28.6                                                    | 17.7          | 12.5         | 20.1           | 17.7                                                             | 2,785,233,529                                                             |
| 1848      | 205,939,646                  | 333,048,212   | 166,473,368  | 230,760,639    | 28.6                                                    | 15.3          | 10.9         | 17.6           | 16.3                                                             | 944,830,641                                                               |
| 1849      | 204,562,490                  | 372,132,045   | 159,193,320  | 267,172,941    | 28.9                                                    | 15.9          | 11.1         | 17.3           | 16.6                                                             | 1,002,609,439                                                             |
| 1850      | 216,499,899                  | 393,154,091   | 173,730,473  | 311,674,341    | 28.0                                                    | 16.2          | 11.2         | 16.2           | 16.4                                                             | 1,096,178,870                                                             |
| 1851      | 252,530,552                  | 446,370,059   | 184,580,409  | 368,699,146    | 27.5                                                    | 15.4          | 10.9         | 15.5           | 15.9                                                             | 1,255,617,005                                                             |
| Total...  | 879,533,587                  | 1,544,704,407 | 683,977,570  | 1,178,307,067  | 28.2                                                    | 15.7          | 11.0         | 16.4           | 16.3                                                             | 4,259,235,955                                                             |
| 1852      | 269,799,172                  | 466,207,123   | 155,361,877  | 479,778,033    | 26.6                                                    | 15.1          | 10.0         | 16.0           | 15.8                                                             | 1,370,792,153                                                             |



This Table shews that the average distance travelled by the passengers of each class is yearly becoming less and less. This is observable in a remarkable degree in the second, third, and the parliamentary classes; and also to some extent in the first class. The following Abstract gives a succinct view of these facts:—

## ABSTRACT E.

| During the Years | Average Distance in Miles travelled by Passengers in the |               |              |                      |              |
|------------------|----------------------------------------------------------|---------------|--------------|----------------------|--------------|
|                  | First Class.                                             | Second Class. | Third Class. | Parliamentary Class. | All Classes. |
| 1844 to 47       | 28·6                                                     | 17·7          | 12·5         | 20·1                 | 17·7         |
| 1848 ... 51      | 28 2                                                     | 15·7          | 11·0         | 16·4                 | 16·3         |
| 1852             | 26·6                                                     | 15·1          | 10·0         | 16·0                 | 15·8         |

The figures given in this Abstract disclose the remarkable feature connected with the introduction of cheap fares, and which, at first sight, may appear anomalous, viz., that of passengers by the parliamentary trains, travelling greater distances than those by either the second or third class carriages. An examination, however, of the facts given in Table II, with regard to third class passengers, will help to throw some light on this result. It will be there seen that, ever since the year 1846, little or no change has taken place in the amount of the third class traffic; in fact, the obviously absurd plan in use in this country, of having four classes or grades of passengers, has had the effect of almost neutralizing the third class and substituting the parliamentary; but this is evidently not the only effect which the cheap parliamentary fares have had on the character of the passenger traffic. The upper and middle classes, for whom the first and second class modes of conveyance are more particularly designed, are so circumstanced in their travelling excursions, as to be called on to go greater distances than those to whom the lower fares are a necessity. The avocations, business arrangements, and social relations of the wealthy and the middle classes are generally such as to involve the necessity of travelling to greater distances, and hence we should naturally expect the lessening average distance of each journey as shewn in Abstract E, with respect to the first, second, and third classes; but whence the amount of the increased distances travelled by the parliamentary class beyond that by either the second or third class? It will be found in the circumstance of the immense disparity between the fares of the parliamentary trains and those of the first and second class, which induces a large number of persons, going distant journies, to economise their expenses by the great saving in the prices of parliamentary trains. And this explanation will be fully understood by any one making a careful examination of the ninth column of Table II, and also the fifth column of Table III, in which it will be found, that during the year 1852 the traffic of the parliamentary class had so rapidly and so greatly increased, that



The total Mileage exceeded that of the Third Class by 324,416,156 miles.

The total Mileage exceeded that of the First Class by 209,978,861 ...

The total Mileage exceeded that of the First and  
Third Classes united by . . . . . } 54,616,984 ...

And even exceeded the total Mileage of the Second  
Class by . . . . . } 13,570,910 ...

Nothing more is needed to shew the growing importance of cheap fares, and whence arises the unexpected result of the prolonged average journeys in the parliamentary classes beyond all the other classes except the first. It might almost be affirmed, from an inspection of column 5, Table II, and the last column of Abstract D, that even railway directors are themselves beginning to understand the importance of parliamentary trains and cheap fares; for while the fares of every other class shew a very decided tendency to increase, the scale of the parliamentary class has been gradually lowering ever since the year 1849; and the legitimate consequence of this decrease in the rate of charge has been an increase of the revenue of that class, both absolutely, and relatively to the receipts from the whole passenger traffic.

#### ABSTRACT F.

| During the Years<br>ending | Amount of Revenue from |                           |                                                             |
|----------------------------|------------------------|---------------------------|-------------------------------------------------------------|
|                            | All Classes.           | Parliamentary<br>Classes. | Ratio of Receipts in Parliamentary<br>Class to all Classes. |
| 30th June, 1849 . .        | £<br>6,105,975         | £<br>1,059,786            | 17·3 per cent.                                              |
| 30th June, 1852 . .        | 7,984,652              | 1,809,163                 | 22·7 per cent.                                              |
| Increase . .               | 1,878,677              | 749,377                   |                                                             |

It thus appears, that no less than 22·7 per cent. of the whole revenue from passenger traffic arises from parliamentary fares.

Apart from their financial interest and value, some of the conclusions arising directly out of the preceding Tables and Abstracts are of immediate importance in questions hereafter arising in this paper.

1st. The fact that, while since the year 1842 the extent of railway communication has increased 296 per cent., the number of passengers has increased at the higher ratio of 357 per cent.

2nd. Although the total mileage has increased from 332,500,000 miles to no less than 1,370,792,153 miles per annum in the same period, still the average distance travelled by each passenger, taking all classes collectively, has decreased from 17·5 miles to 15·8 miles each journey; and,

3rd. Consequently, this modification in the traffic of passengers must be attended with an increased number of arrivals and departures from the various railway stations, relatively to the whole amount of passenger traffic; a



circumstance which will be found to have an important bearing on some of the results to be hereafter discussed.

Much has of late been written on the causes of railway accidents, and an endless variety of suggestions have been offered for their prevention for the future; but, almost without a single exception, the whole of what has been written, and all the remedies proposed, appear to have originated from observations on isolated, or at all events on a very partial number of cases, and nothing like a fair attempt has been made to analyse the whole of the accidents, so as to shew the numerical frequency of each kind, or its tendency to occasion loss of life or limb. Some, while urging the necessity of improvement in the use and management of signals, will be found to assume that nearly all the accidents are due to causes which the suggested improvements would remove. Others again, while adopting the same view to a greater or less extent, take for granted that the bulk of all the accidents assume the form of collisions, and not contenting themselves with the simple aid of the telegraph and other station signals, bring before the public new forms of breaks and other kindred appliances, calculated to stop, in a speedy manner, trains while in motion. These and many other modes of looking at railway accidents, may, and very likely will, lead to improvements; but still it will be found that the majority of accidents would be left untouched, and a great deal would remain to be done before anything like a considerable reduction in them is effected. From looking at so important a subject from such partial points of view, very little benefit is to be hoped; and under this conviction it has been thought necessary, prior to entering on the consideration of remedies, to ascertain, as correctly as possible, the true nature, extent, and causes of the various kinds of accidents.

A little reflection will suffice to shew that all railway accidents may be so classified as to exhibit them—

1st. In relation to causes directly connected with the state and condition of the road and permanent way; and,

2nd. As connected with the construction and management of the rolling stock, namely, engines, carriages, trucks, &c. And this last branch of the classification is susceptible of many subdivisions; for even assuming that the permanent way, locomotive machinery, and appliances, were perfect in construction and durability, a large class of accidents will be found to take place from causes involving the considerations of skill in the management of the various details of a railway and the working of trains and signals.

In the following analysis of the accidents, an attempt has been made to effect such a classification of them as would shew to what extent they were due to causes beyond the control of the respective companies; and also exhibit in what degree they were due to causes falling within the control or management of the companies.

By this mode of inquiry, results, it is hoped, will be arrived at to enable the



public either to judge how far the frequently occurring accidents are susceptible of diminution, by the exercise of greater vigilance on the part of the railway staff and the employment of greater intelligence, or, by bringing into more prominent view the defects in the construction and maintenance of the permanent way and the machinery, to suggest improvements.

In such an analysis, considerable care is needed as to the precise form or kind of cause under which the accidents should be arranged; for it is evident that the same general kind of accident might be repeated over and over again, but in a slightly modified form in regard to some of its details, thus rendering it quite possible to make many subdivisions in the general class or cause. It must, however, be obvious that subdivisions of this kind might be carried so far as to deprive the results of any practical value: unless each embraced a sufficient group of facts from which to draw conclusions, not only as to the characteristic results of that particular class of accidents, but also as to the permanency of the connecting circumstances usually giving birth to them, no importance could be attached to such minute subdivisions. In order to avoid the evils which would result from any attempt to deduce general principles from observations on a distinctive group of accidents of small numerical value in itself, several such groups have in many cases been combined, having one or more points of common agreement. Keeping considerations of this kind closely in view, and never losing sight of the urgent necessity, that the results to be arrived at should have a strictly practical bearing and application, the analysis made has recognised twelve principal causes or rather conditions under which accidents have taken place, six of which are assignable to circumstances over which the companies have no direct or certain control; the other six embracing causes which fall directly under the control of the companies, through their officers and servants.

Having thus decided on a mode of inquiry which was deemed calculated to exhibit with sufficient precision for practical purposes the causes of the various accidents, it next appeared important to adopt a separate and distinct classification of them as they affected passengers, as they affected the public not passengers for the time being, and as they affected the officers and different servants of railway companies.

As it was also of importance to determine the variations, if any, at different periods in the frequency of railway accidents from different causes, the results will be found given for each year, for each cause, and for each class of persons.

In the following eight Tables will be found a detailed record of the number of persons killed, and of the number injured, in each year since 1840, from each of twelve different causes.

Table IV has reference to passengers only.

Table V has reference to the public not passengers, very often the friends of passengers accompanying them to the station, or meeting them on arrival.

Table VI has reference to trespassers on the lines.

Tables VII—XI inclusive, relate to the employés of the companies.



TABLE IV.—Number of Deaths and Injuries from various causes among PASSENGERS.

| CAUSE.                                 | Reference No. | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|----------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                        |               | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Collision . . . . .                    | 1             | 4       | 13       | 3       | 35       | 6       | 5        | ..      | ..       | 5       | 55       | 3       | 28       | 1       | 11       | 2       | 10       | ..      | 28       | 16      | 2        | 29      | 6        | 148     | 3        | 117     | 29       | 496     |          |
| Off line . . . . .                     | 2             | 9       | 27       | 5       | 7        | 5       | 3        | ..      | ..       | ..      | 3        | ..      | 12       | ..      | 17       | 5       | 18       | ..      | 12       | 5       | ..       | 18      | 9        | 48      | ..       | 17      | 35       | 202     |          |
| Running into station . . . . .         | 3             | 1       | 7        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      |          |
| Axle breaking (d) . . . . .            | 4             | 2       | 10       | 2       | ..       | 1       | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | 4        | 33      | 5        | 54      |          |
| Machinery ditto (e) . . . . .          | 5             | ..      | 4        | ..      | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 6        | 15      |          |
| Falling from train (e) . . . . .       | 6             | 2       | 2        | 2       | 3        | 2       | 8        | 1       | 5        | 1       | 1        | 2       | ..       | 1       | ..       | 2       | 1        | 1       | 2        | 2       | 6        | 7       | 2        | ..      | ..       | ..      | 2        | 31      |          |
| Jumping from ditto (b) . . . . .       | 7             | ..      | 5        | 2       | 8        | ..      | ..       | ..      | ..       | 2       | 4        | 2       | 3        | 5       | 9        | 5       | 7        | 2       | 3        | ..      | 3        | 2       | 1        | 4       | 2        | ..      | 16       | 16      |          |
| Run over (f) . . . . .                 | 8             | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | 3       | 1        | 5       | 4        | 1       | 4        | 4       | 4        | ..      | 34       | 64      |          |
| Collision at station . . . . .         | 9             | 4       | 68       | 1       | 13       | ..      | ..       | 1       | 1        | ..      | 6        | 1       | 42       | 3       | 74       | 7       | 32       | 7       | 81       | 43      | 6        | 97      | 3        | 146     | 2        | 204     | 35       | 807     |          |
| Mounting train in motion (a) . . . . . | 10            | ..      | 1        | 1       | 2        | 2       | 2        | 2       | 2        | 1       | 1        | 2       | 2        | 2       | 4        | 3       | 1        | 1       | 1        | 5       | 6        | 8       | 5        | 10      | 10       | 3       | 39       | 43      |          |
| Crushed . . . . .                      | 11            | 2       | 5        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 2       | ..       | ..      | ..       | ..      | ..       | ..      | 1        | ..      | ..       | ..      | 5        | 5       |          |
| Miscellaneous . . . . .                | 12            | ..      | ..       | 9       | 14       | 2       | ..       | 2       | ..       | ..      | ..       | ..      | ..       | 5       | 3        | 3       | 22       | 2       | ..       | 4       | 3        | 10      | 2        | 4       | 5        | 2       | 38       | 61      |          |
| Total . . . . .                        | ..            | 24      | 142      | 26      | 83       | 5       | 26       | 6       | 9        | 10      | 70       | 10      | 87       | 17      | 120      | 31      | 93       | 20      | 135      | 23      | 96       | 28      | 181      | 36      | 373      | 30      | 381      | 266     | 1796     |

TABLE V.—Number of Deaths and Injuries from various causes among PUBLIC BY THEIR OWN NEGLIGENCE.

| CAUSE.                             | Reference No. | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                    |               | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Collision . . . . .                | 1             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Off line . . . . .                 | 2             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Running into station . . . . .     | 3             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Axle breaking . . . . .            | 4             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Machinery ditto . . . . .          | 5             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Falling from train . . . . .       | 6             | ..      | 1        | ..      | 1        | ..      | 1        | ..      | ..       | 2       | 1        | 1       | 2        | 1       | ..       | 2       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Jumping from ditto . . . . .       | 7             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Run over. . . . .                  | 8             | 4       | 1        | 7       | 5        | 8       | 1        | 10      | 3        | 12      | 3        | 5       | 4        | 12      | 6        | 15      | 3        | 6       | 1        | 9       | 16       | ..      | 16       | ..      | 16       | 2       | 133      | 29      | ..       |
| Collision at station. . . . .      | 9             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Mounting train in motion . . . . . | 10            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Crushed . . . . .                  | 11            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Miscellaneous . . . . .            | 12            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 1        | 1       | 4        | 1       | 2        | 1       | 1        | 1       | 2        | 2       | 1        | 4       | 4        | 1       | 1        | 5       | 6        | 1       | 4        | 25      | 26       |
| Total . . . . .                    | ..            | 4       | 2        | 7       | 6        | 8       | 2        | 10      | 4        | 16      | 9        | 8       | 8        | 15      | 7        | 21      | 5        | 8       | 2        | 10      | 5        | 21      | 2        | 23      | 5        | 24      | 8        | 175     | 65       |



TABLE VI.—Number of Deaths and Injuries from various causes among  
TRESPASSERS.

| Cause.                             | Reference No. | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                    |               | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Collision . . . . .                | 1             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       |
| Off line . . . . .                 | 2             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Running into station . . . . .     | 3             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Axle breaking . . . . .            | 4             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Machinery ditto . . . . .          | 5             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Falling from train . . . . .       | 6             | ..      | 2        | ..      | ..       | ..      | ..       | ..      | 1        | ..      | 2        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Jumping from ditto . . . . .       | 7             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Run over . . . . .                 | 8             | 2       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Collision at station . . . . .     | 9             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Mounting train in motion . . . . . | 10            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Crushed . . . . .                  | 11            | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Miscellaneous . . . . .            | 12            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Total . . . . .                    | ..            | 3       | 2        | 7       | 5        | 17      | 8        | 12      | 7        | 7       | 4        | 24      | 4        | 18      | 2        | 37      | 9        | 36      | 8        | 37      | 7        | 31      | 10       | 39      | 10       | 39      | 8        | 306     | 84       |

TABLE VII.—Number of Deaths and Injuries from various causes among  
ENGINE DRIVERS.

| CAUSE.                             | Reference No. | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                    |               | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Collision . . . . .                | 1             | ..      | 4        | ..      | ..       | ..      | ..       | ..      | ..       | 2       | ..       | 2       | ..       | 1       | 2        | 1       | 1        | 1       | ..       | 2       | 1        | ..      | 1        | ..      | ..       | 1       | 6        | 13      |          |
| Off line . . . . .                 | 2             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 1        | 1       | ..       | 2       | 2        | 4       | 3        | 2       | 5        | ..      | 2        | ..      | 5        | ..      | ..       | 5       | 19       | 21      |          |
| Running into station . . . . .     | 3             | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      |          |
| Axle breaking . . . . .            | 4             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 1        | ..      | ..       | ..      | ..       | 2       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       |          |
| Machinery ditto . . . . .          | 5             | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      | 2        | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 2        | ..      | ..       | ..      | ..       | ..      | ..       | ..      |          |
| Falling from train . . . . .       | 6             | ..      | 2        | 1       | ..       | 1       | 1        | 1       | 3        | 1       | 1        | ..      | ..       | 2       | 2        | ..      | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 1        | ..      | ..       | 1       |          |
| Jumping from ditto . . . . .       | 7             | ..      | ..       | ..      | 2        | ..      | 2        | ..      | ..       | ..      | ..       | 1       | 1        | 1       | 1        | 1       | ..       | ..      | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      |          |
| Run over . . . . .                 | 8             | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 3       | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      |          |
| Collision at station . . . . .     | 9             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | 5       | ..       | 1       | ..       | 3       | ..       | ..      | ..       | 1       | ..       | ..      | 2        | 4       | 5        | 14      |          |
| Mounting train in motion . . . . . | 10            | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | 1       | ..       | 4       | 1        | ..      |          |
| Crushed . . . . .                  | 11            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 1        | ..      | ..       | ..      | ..       | ..      | ..       | 1       | 1        | 2       | ..       | ..      | ..       | 2       | ..       | 3       | 4        | ..      |          |
| Miscellaneous . . . . .            | 12            | ..      | ..       | ..      | 2        | ..      | ..       | ..      | 1        | 2       | 1        | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | 2       | 1        | 2       | 1        | 1       | ..       | 10      | 9        | ..      |          |
| Total . . . . .                    | ..            | 1       | 6        | 1       | 4        | 2       | 4        | 3       | 4        | 7       | 6        | 3       | 5        | 7       | 14       | 11      | 6        | 11      | 8        | 4       | 11       | 5       | 11       | 10      | 73       | 94      | 94       | 94      |          |



TABLE VIII.—Number of Deaths and Injuries from various causes among

## STOKERS.

| CAUSE.                             | Reference No. | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                    |               | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Collision . . . . .                | 1             | ..      | ..       | ..      | ..       | 1       | 1        | ..      | ..       | 2       | 2        | 1       | 1        | 1       | 1        | 1       | 1        | 2       | 3        | 1       | ..       | 1       | ..       | 1       | ..       | 2       | 1        | 8       | 9        |
| Off line . . . . .                 | 2             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | 1        | 1       | 1        | 2       | 2        | 1       | 4        | 1       | 3        | 2       | ..       | ..      | 1        | ..      | 2        | 4       | 3        | 13      | 16       |
| Running into station               | 3             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 1        |
| Axle breaking . . . . .            | 4             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 2        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Machinery breaking . . . . .       | 5             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | 2        | ..      | 1        | 1       | 1        | 2       | 3        | 2       | 1        | 3       | ..       | 2       | 1        | ..      | 1        | 1       | 1        | 11      | 10       |
| Falling from train . . . . .       | 6             | ..      | ..       | ..      | 2        | 1       | 2        | 1       | 4        | 2       | 3        | 2       | 2        | ..      | ..       | 4       | 4        | ..      | 3        | 3       | 4        | 5       | 1        | 1       | 1        | 1       | 1        | 28      | 26       |
| Jumping from ditto . . . . .       | 7             | ..      | ..       | ..      | ..       | ..      | 1        | ..      | ..       | ..      | ..       | 1       | ..       | 1       | ..       | ..      | ..       | 1       | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Run over . . . . .                 | 8             | 1       | ..       | ..      | 1        | 2       | 1        | ..      | ..       | ..      | ..       | 1       | ..       | 1       | 1        | 2       | 1        | 1       | 2        | ..      | ..       | 2       | ..       | ..      | 1        | 1       | 1        | 5       | 4        |
| Collision at Station . . . . .     | 9             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 2        | ..      | 4        | 2       | 2        | 2       | 1        | 1       | ..       | 1       | 2        | ..      | 1        | 1       | 4        | 5       | 15       |
| Mounting train in motion . . . . . | 10            | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | 1        | ..      | ..       | 1       | ..       | 2       | 1        | 2       | 1        | 1       | ..       | ..      | 3        | 1       | 7        | 3       | ..       |
| Crushed . . . . .                  | 11            | 5       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 2       | ..       | ..      | ..       | 3       | 1        | 2       | 1        | 3       | 3        | ..      | 2        | 2       | 1        | 1       | 3        | 2       | 13       | 17      | ..       |
| Miscellaneous . . . . .            | 12            | ..      | ..       | 1       | ..       | ..      | ..       | ..      | 1        | 2       | 2        | 1       | ..       | 1       | 1        | 4       | 2        | 1       | 1        | 1       | 2        | 4       | ..       | 3       | 2        | 1       | 15       | 14      | ..       |
| Total . . . . .                    | ..            | 1       | 5        | ..      | 4        | 4       | 5        | 2       | 5        | 6       | 12       | 7       | 8        | 7       | 11       | 22      | 17       | 14      | 14       | 13      | 7        | 16      | 8        | 6       | 10       | 17      | 116      | 123     | ..       |

TABLE IX.—Number of Deaths and Injuries from various causes among

## GUARDS.

| CAUSE.                             | Reference No. | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                    |               | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Collision . . . . .                | 1             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | 1       | ..       | ..      | ..       | 2       | 1        | ..      | 3        | ..      | ..       | 1       | ..       | ..      | ..       | 2       | 3        | 3       | 2        |
| Off line . . . . .                 | 2             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 2       | ..       | 3       | 1        | 1       | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 3       | 6        | 11      | 1        |
| Running into station . . . . .     | 3             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Axle breaking . . . . .            | 4             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Machinery ditto . . . . .          | 5             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | 1       | ..       | ..      | ..       | 2       | ..       | ..      | 1        | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Falling from train . . . . .       | 6             | 1       | ..       | 1       | 1        | 1       | 1        | 4       | 4        | 1       | ..       | 2       | 4        | 1       | 2        | 2       | 1        | 4       | 1        | 6       | 4        | 8       | ..       | 2       | ..       | 1       | 2        | 37      | 17       |
| Jumping from ditto . . . . .       | 7             | ..      | ..       | 1       | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | 1        | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 2        | ..      | ..       |
| Run over . . . . .                 | 8             | ..      | ..       | 1       | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | 1        | 2       | ..       | 1       | 1        | 2       | ..       | 1       | ..       | 3       | 1        | 2       | 1        | 1       | 13       | 4       | 8        |
| Collision at station . . . . .     | 9             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | 1        | 2       | ..       | 1       | 1        | ..      | ..       | ..      | 4        | 2       | ..       | ..      | ..       | 4       | 8        |
| Mounting train in motion . . . . . | 10            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | 1        | ..      | 1        | 4       | ..       | 1       | ..       | 2       | 2        | 1       | ..       | ..      | ..       | 10      | 3        |
| Crushed . . . . .                  | 11            | ..      | ..       | 2       | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | 1        | 2       | 1        | 1       | ..       | 1       | 4        | 3       | 1        | 5       | 2        | 1       | 2        | 14      | 12       |
| Miscellaneous . . . . .            | 12            | 1       | ..       | 1       | ..       | 3       | 1        | 1       | 1        | 4       | 4        | 1       | 2        | 1       | 2        | 3       | ..       | 8       | 2        | 4       | 4        | 3       | 5        | 2       | 2        | 6       | 6        | 37      | 30       |
| Total . . . . .                    | ..            | ..      | 2        | 1       | 5        | 7       | 2        | 5       | 2        | 5       | 6        | 6       | 7        | 9       | 9        | 10      | 9        | 22      | 10       | 15      | 14       | 21      | 15       | 14      | 8        | 16      | 12       | 127     | 100      |



TABLE X.—Number of Deaths and Injuries from various causes among  
PORTERS.

| CAUSE.                             | Reference No. | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                    |               | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Collision . . . . .                | 1             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Off line . . . . .                 | 2             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Running into station . . . . .     | 3             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Axle breaking . . . . .            | 4             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Machinery . . . . .                | 5             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Falling from train . . . . .       | 6             | 1       | ..       | 1       | 1        | 1       | 1        | ..      | ..       | 1       | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | 1       | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Jumping from ditto . . . . .       | 7             | ..      | ..       | 1       | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Run over . . . . .                 | 8             | ..      | ..       | 1       | 1        | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Collision at station . . . . .     | 9             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Mounting train in motion . . . . . | 10            | ..      | ..       | ..      | ..       | 1       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Crushed . . . . .                  | 11            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Miscellaneous . . . . .            | 12            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Total . . . . .                    | ..            | 1       | ..       | 4       | 3        | 3       | 2        | 8       | 4        | 6       | 4        | 6       | 2        | 7       | 7        | 12      | 4        | 10      | 6        | 13      | 8        | 9       | 5        | 19      | 11       | 19      | 9        | 117     | 65       |

TABLE XI.—Number of Deaths and Injuries from various causes among  
OTHER SERVANTS.

| CAUSE.                             | Reference No. | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|------------------------------------|---------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                    |               | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Collision . . . . .                | 1             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Off line . . . . .                 | 2             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Running into station . . . . .     | 3             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Axle breaking . . . . .            | 4             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Machinery ditto . . . . .          | 5             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Falling from train . . . . .       | 6             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Jumping from ditto . . . . .       | 7             | 1       | 1        | 2       | 11       | 2       | 11       | 1       | ..       | 3       | 1        | 1       | 3        | 2       | 3        | 5       | 4        | 1       | 3        | 2       | 1        | 3       | 1        | 2       | 1        | 5       | 1        | 25      | 31       |
| Run over . . . . .                 | 8             | 9       | 2        | 19      | 11       | 17      | 11       | 11      | 4        | 16      | 1        | 19      | 5        | 42      | 8        | 38      | 14       | 45      | 4        | 41      | 1        | 39      | ..       | 25      | 3        | 6       | 353      | 70      | 70       |
| Collision at station . . . . .     | 9             | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Mounting train in motion . . . . . | 10            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Crushed . . . . .                  | 11            | 2       | 3        | ..      | ..       | 3       | 2        | ..      | 2        | ..      | ..       | 3       | 2        | 6       | 2        | ..      | ..       | 6       | 5        | 8       | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Miscellaneous . . . . .            | 12            | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       | ..      | ..       |
| Total . . . . .                    | ..            | 12      | 8        | 23      | 18       | 27      | 22       | 21      | 13       | 28      | 17       | 36      | 23       | 61      | 35       | 67      | 31       | 86      | 33       | 82      | 41       | 79      | 22       | 63      | 21       | 63      | 37       | 648     | 321      |



The following is a condensed summary of the results of the preceding eight Tables:—

## ABSTRACT G.

*Deaths and Injuries amongst Different Classes, from all Causes, from the 7th August, 1840, to the 31st December, 1852.*

| CLASS.                                | Killed. | Injured. | Ratio of Injured to Killed. |
|---------------------------------------|---------|----------|-----------------------------|
| Passengers . . . . .                  | 266     | 1,796    | 675·20 per cent.            |
| Public, by their own negligence . . . | 175     | 65       | 37·14 ...                   |
| Trespassers . . . . .                 | 306     | 84       | 27·45 ...                   |
| Engine Drivers . . . . .              | 73      | 94       | 128·77 ...                  |
| Stokers . . . . .                     | 116     | 123      | 106·04 ...                  |
| Guards . . . . .                      | 127     | 100      | 78·74 ...                   |
| Porters . . . . .                     | 117     | 65       | 55·56 ...                   |
| Other Servants . . . . .              | 648     | 321      | 49·54 ...                   |
| Total . . . . .                       | 1,828   | 2,648    | 144·86 per cent.            |

The last column of this Abstract shews in one respect a most remarkable difference in the way in which the accidents affect passengers and the servants of the companies. The number injured amongst passengers being in the ratio of 675·20 per cent. to that of the killed; but amongst railway servants, the number of injuries falls short of the number of deaths, the ratio of injuries being almost exactly 65 per cent. of the deaths. The cause of this distinction will hereafter appear.

On referring to Table II preceding, it will be found, that within the period to which the facts of the preceding Abstracts relate, the total number of passengers amounted to 615,133,727. And, consequently  $\frac{615,133,727}{266}$ , or one in every 2,312,533 passengers has been killed since the 7th of August, 1840.

And in like manner  $\frac{615,133,727}{1,796}$ , or one in every 342,502 passengers has sustained serious bodily injury in the same time. So that, if the causes which have hitherto prevailed in producing railway accidents should remain constant, the preceding ratios would measure the risk of life and limb in railway travelling.

The following Table gives the result of Tables IV to XI, in a more condensed form by omitting the causes of the accidents.



TABLE XII.  
*Total Number of Persons Killed and Injured on Railways.*

| Class.                             | 1840.   |          | 1841.   |          | 1842.   |          | 1843.   |          | 1844.   |          | 1845.   |          | 1846.   |          | 1847.   |          | 1848.   |          | 1849.   |          | 1850.   |          | 1851.   |          | 1852.   |          | Total.  |          |
|------------------------------------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|---------|----------|
|                                    | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. |
| Passengers . . .                   | 24      | 142      | 26      | 83       | 5       | 26       | 6       | 9        | 10      | 70       | 10      | 87       | 17      | 120      | 31      | 93       | 20      | 135      | 23      | 96       | 28      | 181      | 36      | 373      | 30      | 381      | 266     | 1,796    |
| Public by their<br>own Negligence) | 4       | 2        | 7       | 6        | 8       | 2        | 10      | 4        | 16      | 9        | 8       | 8        | 15      | 7        | 21      | 5        | 8       | 2        | 10      | 5        | 21      | 2        | 23      | 5        | 24      | 8        | 175     | 65       |
| Trespassers . .                    | 3       | 2        | 7       | 5        | 17      | 8        | 12      | 7        | 6       | 4        | 24      | 4        | 18      | 2        | 37      | 9        | 36      | 8        | 37      | 7        | 31      | 10       | 39      | 10       | 39      | 8        | 306     | 84       |
| Engine Drivers .                   | 1       | 6        | 1       | 4        | 2       | 4        | 3       | 4        | 7       | 6        | 3       | 5        | 7       | 14       | 11      | 6        | 6       | 11       | 6       | 8        | 4       | 11       | 11      | 5        | 11      | 10       | 73      | 94       |
| Stokers . . . .                    | 1       | 5        | ..      | 4        | 4       | 5        | 2       | 5        | 6       | 12       | 7       | 8        | 7       | 11       | 22      | 17       | 14      | 14       | 13      | 7        | 16      | 8        | 6       | 10       | 18      | 17       | 116     | 123      |
| Guards . . . .                     | ..      | 2        | 1       | 5        | 7       | 2        | 5       | 2        | 5       | 6        | 6       | 7        | 9       | 9        | 10      | 9        | 22      | 10       | 15      | 14       | 21      | 15       | 14      | 3        | 12      | 16       | 127     | 100      |
| Porters . . . .                    | 1       | ..       | 4       | 3        | 3       | 2        | 8       | 4        | 6       | 4        | 6       | 2        | 7       | 7        | 12      | 4        | 10      | 6        | 13      | 8        | 9       | 5        | 19      | 11       | 19      | 9        | 117     | 65       |
| Other Servants .                   | 12      | 8        | 23      | 18       | 27      | 22       | 21      | 13       | 28      | 17       | 36      | 23       | 61      | 35       | 67      | 31       | 86      | 33       | 82      | 41       | 79      | 22       | 63      | 21       | 63      | 37       | 648     | 321      |
| Total . . .                        | 46      | 167      | 69      | 128      | 73      | 71       | 67      | 48       | 84      | 128      | 100     | 144      | 141     | 205      | 211     | 174      | 202     | 219      | 199     | 186      | 209     | 254      | 211     | 438      | 216     | 486      | 1,828   | 2,648    |



The following condensed summary of this Table, so far as passengers are affected, shews, in a very satisfactory way, the gradual diminution of railway accidents.

## ABSTRACT H.

| PERIOD. | Passengers. |         |          | Ratios.       |                |
|---------|-------------|---------|----------|---------------|----------------|
|         | Number.     | Killed. | Injured. | One killed in | One injured in |
| 1840-43 | 57,617,578  | 61      | 260      | 944,550       | 221,606        |
| 1844-47 | 156,698,002 | 68      | 370      | 2,304,382     | 423,508        |
| 1848-51 | 264,173,027 | 107     | 785      | 2,468,907     | 336,526        |
| 1852    | 86,758,997  | 30      | 381      | 2,891,966     | 227,714        |

It thus appears that, while in the years 1840-43, there was 1 killed in every 944,550 passengers, there was, in the years 1848-51, only 1 in every 2,468,907 passengers, being not one death for two which happened in the earlier period.

So also will a reduction be found to have taken place in the ratio of passengers injured.

In like manner will Table XII furnish the means by which to determine the relative number of railway servants killed and injured in the same periods; but it is proposed, in the first place, to keep to that part of the inquiry which affects the passengers only. This, although really the least important branch of the subject, so far as loss of life is concerned, is, nevertheless, that in which the general public is most interested; and, as the daily and periodical press have recently taken up the matter so warmly, as complete an analysis of it will be given in this paper as the available facts and data will admit of being accomplished. In order to carry out this view, the whole of the materials have been re-arranged in the following eight Tables, from which a very distinct and complete knowledge of the intensity of each cause in producing accidents among all the classes of persons observed upon, in each year, and throughout the whole period, may be obtained.

It will be seen from Tables XIV and XV, that the number of deaths from railway accidents among the public, not being either passengers or employés, is much greater than amongst passengers merely.

The number of passengers killed, according to Table XIII, is 266.

The number killed of the public (neither passengers nor employés), by their own negligence, and of trespassers, is 481.

But the consideration of the last group of deaths will be likewise reserved for discussion in the latter part of this communication.



TABLE XIII.

*Number of Deaths and Injuries from various causes among PASSENGERS.*

| Years.   | Collision. |          | Off Line. |          | Running into Station. |          | (d) Axle Breaking. |          | (e) Machinery Breaking. |          | (c) Falling from Train. |          | (b) Jumping from Train. |          | (f) Run over. |          | Collision at Station. |          | (a) Mounting Train in motion. |          | Crushed. |          | Miscellaneous. |          | Years.      | Total.  |          |
|----------|------------|----------|-----------|----------|-----------------------|----------|--------------------|----------|-------------------------|----------|-------------------------|----------|-------------------------|----------|---------------|----------|-----------------------|----------|-------------------------------|----------|----------|----------|----------------|----------|-------------|---------|----------|
|          | Killed.    | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.            | Injured. | Killed.                 | Injured. | Killed.                 | Injured. | Killed.                 | Injured. | Killed.       | Injured. | Killed.               | Injured. | Killed.                       | Injured. | Killed.  | Injured. | Killed.        | Injured. |             | Killed. | Injured. |
| 1840     | 4          | 13       | 9         | 27       | 1                     | 7        | 2                  | 10       | ..                      | 4        | 2                       | 2        | 5                       | ..       | ..            | ..       | 4                     | 68       | ..                            | 1        | 2        | 2        | 5              | ..       | 1840        | 24      | 142      |
| 1841     | 3          | 35       | 5         | 7        | ..                    | ..       | 2                  | ..       | 1                       | 2        | 3                       | 8        | 2                       | 8        | 1             | ..       | 1                     | 13       | 1                             | 2        | ..       | ..       | 14             | 1841     | 26          | 83      |          |
| 1842     | ..         | 6        | ..        | 5        | ..                    | ..       | 1                  | 3        | ..                      | ..       | ..                      | 2        | 8                       | ..       | ..            | ..       | ..                    | ..       | 2                             | 2        | ..       | ..       | ..             | 1842     | 5           | 26      |          |
| 1843     | ..         | ..       | ..        | ..       | ..                    | ..       | ..                 | ..       | ..                      | ..       | 1                       | 5        | 5                       | 1        | ..            | ..       | 1                     | 1        | 2                             | 2        | ..       | ..       | ..             | 1843     | 6           | 9       |          |
|          | 7          | 54       | 14        | 39       | 1                     | 7        | 5                  | 13       | 5                       | ..       | 4                       | 8        | 3                       | 26       | 1             | ..       | 6                     | 82       | 5                             | 7        | 2        | 5        | 13             | 14       |             | 61      | 260      |
| 1844     | 5          | 55       | ..        | 3        | ..                    | ..       | 1                  | ..       | ..                      | ..       | 1                       | 1        | 4                       | ..       | ..            | ..       | ..                    | 6        | 1                             | 1        | ..       | ..       | ..             | 1844     | 10          | 70      |          |
| 1845     | 3          | 28       | ..        | 12       | ..                    | ..       | ..                 | ..       | ..                      | ..       | 2                       | ..       | 3                       | 2        | ..            | ..       | 1                     | 42       | 2                             | 2        | ..       | ..       | ..             | 1845     | 10          | 87      |          |
| 1846     | 1          | 11       | ..        | 17       | ..                    | ..       | ..                 | 1        | 1                       | 1        | ..                      | 9        | 5                       | 9        | ..            | ..       | 3                     | 74       | 2                             | 4        | ..       | ..       | 3              | 1846     | 17          | 120     |          |
| 1847     | 2          | 10       | 5         | 18       | ..                    | ..       | ..                 | ..       | 2                       | 2        | 1                       | 7        | 5                       | 7        | 1             | ..       | 7                     | 32       | 3                             | 1        | 2        | ..       | 22             | 1847     | 31          | 93      |          |
|          | 11         | 104      | 5         | 50       | ..                    | ..       | 1                  | 1        | 3                       | 2        | 5                       | 2        | 14                      | 23       | 1             | ..       | 11                    | 154      | 8                             | 8        | 2        | ..       | 8              | 25       |             | 68      | 370      |
| 1848     | ..         | 28       | 2         | 12       | ..                    | 5        | ..                 | ..       | ..                      | ..       | 1                       | 2        | 3                       | 3        | 3             | 1        | 7                     | 81       | 3                             | 1        | ..       | ..       | 2              | 1848     | 20          | 135     |          |
| 1849     | ..         | 16       | 5         | 18       | ..                    | ..       | ..                 | ..       | 6                       | 2        | 2                       | 3        | 1                       | 3        | 5             | ..       | ..                    | 43       | 5                             | 6        | ..       | ..       | 4              | 1849     | 23          | 96      |          |
| 1850     | 2          | 29       | ..        | 18       | ..                    | 8        | ..                 | ..       | 7                       | 2        | ..                      | 2        | 8                       | 1        | 4             | 1        | 6                     | 97       | 3                             | 8        | ..       | ..       | 10             | 1850     | 28          | 181     |          |
| 1851     | 6          | 148      | 9         | 48       | ..                    | 1        | ..                 | ..       | 10                      | 2        | 2                       | 4        | 4                       | 4        | 4             | ..       | 3                     | 146      | 5                             | 10       | 1        | ..       | 4              | 1851     | 36          | 373     |          |
|          | 8          | 221      | 16        | 96       | ..                    | 14       | ..                 | ..       | 23                      | 7        | 6                       | 11       | 15                      | 11       | 16            | 2        | 16                    | 367      | 16                            | 25       | 1        | ..       | 12             | 20       |             | 107     | 785      |
| 1852     | 3          | 117      | ..        | 17       | 4                     | 33       | ..                 | 1        | ..                      | ..       | ..                      | 2        | 4                       | 4        | ..            | ..       | 2                     | 204      | 10                            | 3        | ..       | ..       | 5              | 2        |             | 30      | 381      |
| Totals.. | 29         | 496      | 35        | 202      | 5                     | 54       | 6                  | 15       | 2                       | 31       | 16                      | 16       | 34                      | 64       | 22            | 2        | 35                    | 807      | 39                            | 43       | 5        | 5        | 38             | 61       | Grand Total | 266     | 1,796    |



TABLE XIV.

*Number of Deaths and Injuries from various causes among*

PUBLIC BY THEIR OWN NEGLIGENCE.

| Years. | Collision. |          | Off Line. |          | Running into Station. |          | Axle Breaking. |          | Machinery Breaking. |          | Falling from Train. |          | Jumping from Train. |          | Run Over. |          | Collision at Station. |          | Mounting Train in Motion. |          | Crushed. |          | Miscellaneous. |          | Years.       |         | Total.   |        |
|--------|------------|----------|-----------|----------|-----------------------|----------|----------------|----------|---------------------|----------|---------------------|----------|---------------------|----------|-----------|----------|-----------------------|----------|---------------------------|----------|----------|----------|----------------|----------|--------------|---------|----------|--------|
|        | Killed.    | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.        | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.                   | Injured. | Killed.  | Injured. | Killed.        | Injured. | Years.       | Killed. | Injured. | Total. |
| 1840   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 4         | 1        | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1840         | 4       | 2        | 65     |
| 1841   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 7         | 5        | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1841         | 7       | 6        |        |
| 1842   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 8         | 1        | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1842         | 8       | 2        |        |
| 1843   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 10        | 3        | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1843         | 10      | 4        |        |
|        | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 3                   | ..       | ..                  | ..       | 29        | 10       | ..                    | ..       | ..                        | ..       | ..       | ..       | 1              | ..       |              | 29      | 14       | 29     |
| 1844   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 2                   | 1        | ..                  | 1        | 12        | 3        | ..                    | ..       | ..                        | ..       | ..       | ..       | 4              | ..       | 1844         | 16      | 9        |        |
| 1845   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | 2        | ..                  | ..       | 5         | 4        | ..                    | ..       | ..                        | ..       | ..       | ..       | 2              | ..       | 1845         | 8       | 8        |        |
| 1846   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | ..       | 1                   | ..       | 12        | 6        | ..                    | ..       | ..                        | ..       | ..       | ..       | 1              | ..       | 1846         | 15      | 7        |        |
| 1847   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 2                   | ..       | 2                   | ..       | 15        | 3        | ..                    | ..       | ..                        | ..       | 1        | ..       | 2              | ..       | 1847         | 21      | 5        |        |
|        | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 6                   | 3        | 4                   | 1        | 44        | 16       | ..                    | ..       | ..                        | ..       | 1        | ..       | 9              | ..       |              | 60      | 29       | 29     |
| 1848   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 6         | 1        | ..                    | ..       | ..                        | ..       | ..       | ..       | 1              | ..       | 1848         | 8       | 2        |        |
| 1849   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 9         | ..       | ..                    | ..       | ..                        | ..       | ..       | ..       | 4              | ..       | 1849         | 10      | 5        |        |
| 1850   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 16        | ..       | ..                    | ..       | 1                         | ..       | ..       | ..       | 1              | ..       | 1850         | 21      | 2        |        |
| 1851   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 16        | ..       | ..                    | ..       | ..                        | ..       | 1        | ..       | 5              | ..       | 1851         | 23      | 5        |        |
|        | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 47        | 1        | ..                    | ..       | 1                         | ..       | 2        | 1        | 11             | ..       |              | 62      | 14       | 8      |
| 1852   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 13        | 2        | ..                    | ..       | ..                        | ..       | 1        | 1        | 5              | ..       | 1852         | 24      | 8        |        |
| Totals | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 6                   | 6        | 4                   | 1        | 133       | 29       | ..                    | ..       | 3                         | 1        | 4        | 2        | 25             | 26       | Grand Total) | 175     | 65       |        |



TABLE XV.

*Number of Deaths and Injuries from various causes among*

## TRESPASSERS.

| Years. | Collision. |          | Off Line. |          | Running into Station. |          | Axle Breaking. |          | Machinery Breaking. |          | Falling from Train. |          | Jumping from Train. |          | Run Over. |          | Collision at Station. |          | Mounting Train in Motion. |          | Crushed. |          | Miscellaneous. |          | Years.      | Total.  |          |
|--------|------------|----------|-----------|----------|-----------------------|----------|----------------|----------|---------------------|----------|---------------------|----------|---------------------|----------|-----------|----------|-----------------------|----------|---------------------------|----------|----------|----------|----------------|----------|-------------|---------|----------|
|        | Killed.    | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.        | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.                   | Injured. | Killed.  | Injured. | Killed.        | Injured. |             | Killed. | Injured. |
| 1840   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 2                   | ..       | ..                  | ..       | 2         | ..       | ..                    | ..       | ..                        | ..       | 1        | ..       | ..             | ..       | 1840        | 3       | 2        |
| 1841   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | ..       | ..                  | ..       | 6         | ..       | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1841        | 7       | 5        |
| 1842   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 3                   | ..       | ..                  | ..       | 13        | 5        | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1842        | 17      | 8        |
| 1843   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | ..       | ..                  | 1        | 10        | 5        | ..                    | ..       | ..                        | ..       | ..       | ..       | 2              | ..       | 1843        | 12      | 7        |
|        | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 5                   | 6        | 1                   | 1        | 31        | 15       | ..                    | ..       | ..                        | ..       | 1        | ..       | 2              | ..       |             | 39      | 22       |
| 1844   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | 2        | ..                  | 2        | 5         | ..       | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1844        | 6       | 4        |
| 1845   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 22        | 3        | ..                    | ..       | 1                         | ..       | ..       | ..       | ..             | ..       | 1845        | 24      | 4        |
| 1846   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | ..       | ..                  | ..       | 16        | 1        | ..                    | ..       | ..                        | ..       | ..       | ..       | 1              | ..       | 1846        | 18      | 2        |
| 1847   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | 1        | ..                  | ..       | 37        | 8        | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1847        | 37      | 9        |
|        | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 2                   | 3        | ..                  | 2        | 80        | 12       | ..                    | ..       | 1                         | 1        | ..       | ..       | 1              | ..       |             | 85      | 19       |
| 1848   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | 1                   | 31       | 4         | ..       | ..                    | ..       | 1                         | 1        | 1        | ..       | 3              | 1848     | 36          | 8       |          |
| 1849   | ..         | 1        | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 34        | ..       | ..                    | ..       | 1                         | 1        | 2        | ..       | 5              | 1849     | 37          | 7       |          |
| 1850   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | 1        | ..                  | 1        | 26        | 3        | ..                    | ..       | ..                        | ..       | 2        | ..       | 5              | 1850     | 31          | 10      |          |
| 1851   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | 1                   | ..       | ..                  | ..       | ..                  | ..       | 30        | 7        | ..                    | ..       | ..                        | ..       | 2        | ..       | 3              | 1851     | 39          | 10      |          |
|        | ..         | 1        | ..        | ..       | ..                    | ..       | ..             | ..       | 1                   | ..       | 1                   | 1        | 1                   | 1        | 121       | 14       | ..                    | ..       | 2                         | 2        | 7        | ..       | 16             |          | 143         | 35      |          |
| 1852   | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 36        | 4        | ..                    | ..       | ..                        | ..       | 1        | 1        | 3              | 1852     | 39          | 8       |          |
| Totals | ..         | 1        | ..        | ..       | ..                    | ..       | ..             | ..       | 1                   | ..       | 8                   | 10       | 1                   | 4        | 268       | 45       | ..                    | ..       | 10                        | 3        | 9        | 1        | 9              | 20       | Grand Total | 306     | 84       |



*Number of Deaths and Injuries from various causes among*

*Number of Deaths and Injuries from various causes among*

*Number of Deaths and Injuries from various causes among*



TABLE XVII.

*Number of Deaths and Injuries from various causes among  
STOKERS.*

| Years.   | Collision. |          | Off Line. |          | Running into Station. |          | Axle Breaking. |          | Machinery Breaking. |          | Falling from Train. |          | Jumping from Train. |          | Run over. |          | Collision at Station. |          | Mounting Train in motion. |          | Crushed. |          | Miscellaneous. |             | Years. | Total.  |          |
|----------|------------|----------|-----------|----------|-----------------------|----------|----------------|----------|---------------------|----------|---------------------|----------|---------------------|----------|-----------|----------|-----------------------|----------|---------------------------|----------|----------|----------|----------------|-------------|--------|---------|----------|
|          | Killed.    | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.        | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.                   | Injured. | Killed.  | Injured. | Killed.        | Injured.    |        | Killed. | Injured. |
| 1840     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 1         | ..       | ..                    | ..       | ..                        | ..       | 5        | ..       | ..             | ..          | 1840   | 1       | 5        |
| 1841     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | ..        | 1        | ..                    | ..       | ..                        | ..       | ..       | ..       | 1              | ..          | 1841   | ..      | 4        |
| 1842     | 1          | 1        | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | 2        | 1                   | 1        | 2         | ..       | ..                    | ..       | ..                        | 1        | ..       | ..       | ..             | ..          | 1842   | 4       | 5        |
| 1843     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | ..        | ..       | ..                    | ..       | ..                        | ..       | ..       | ..       | 1              | ..          | 1843   | 2       | 5        |
|          | 1          | 1        | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 2                   | 8        | 1                   | ..       | 3         | 2        | ..                    | ..       | 1                         | ..       | 5        | ..       | 2              |             |        | 7       | 19       |
| 1844     | ..         | 2        | 1         | 1        | ..                    | ..       | ..             | 1        | 2                   | 2        | 3                   | 2        | ..                  | ..       | ..        | ..       | ..                    | ..       | ..                        | ..       | 2        | 2        | 2              | 2           | 1844   | 6       | 12       |
| 1845     | 1          | 1        | 1         | 1        | ..                    | ..       | ..             | ..       | 1                   | 1        | 2                   | 2        | 1                   | ..       | 1         | ..       | ..                    | 2        | 1                         | ..       | ..       | ..       | ..             | ..          | 1845   | 7       | 8        |
| 1846     | ..         | 1        | 1         | 2        | ..                    | ..       | ..             | ..       | 1                   | 1        | ..                  | ..       | 1                   | ..       | ..        | 1        | 4                     | 4        | ..                        | ..       | 1        | 1        | 1              | 1           | 1846   | 7       | 11       |
| 1847     | 1          | 1        | 1         | 4        | ..                    | ..       | ..             | ..       | 1                   | 2        | 4                   | 4        | 1                   | ..       | 2         | 1        | 2                     | 2        | ..                        | ..       | 1        | 1        | 2              | 2           | 1847   | 22      | 17       |
|          | 2          | 5        | 4         | 8        | ..                    | ..       | ..             | ..       | 3                   | 6        | 11                  | 9        | 3                   | ..       | 3         | 2        | 8                     | 1        | 1                         | 1        | 5        | 4        | 5              |             |        | 42      | 48       |
| 1848     | ..         | 2        | 1         | 3        | ..                    | ..       | ..             | ..       | 1                   | 1        | 4                   | ..       | 1                   | 1        | 2         | 1        | 2                     | 2        | ..                        | ..       | 4        | 3        | 1              | 1           | 1848   | 14      | 14       |
| 1849     | 1          | ..       | 2         | ..       | ..                    | ..       | ..             | 3        | ..                  | ..       | 3                   | 4        | ..                  | ..       | ..        | ..       | 1                     | ..       | 1                         | ..       | ..       | 2        | 2              | 2           | 1849   | 13      | 7        |
| 1850     | 1          | 1        | ..        | 1        | ..                    | 1        | 5              | 2        | 1                   | 1        | 5                   | 1        | 1                   | ..       | 2         | ..       | 1                     | 2        | ..                        | ..       | 2        | 2        | ..             | ..          | 1850   | 16      | 8        |
| 1851     | 1          | ..       | 2         | 1        | ..                    | ..       | 2              | ..       | 1                   | 1        | 1                   | 1        | ..                  | 1        | ..        | ..       | ..                    | 2        | ..                        | ..       | 1        | 1        | 3              | ..          | 1851   | 6       | 10       |
|          | 3          | 2        | 5         | 5        | ..                    | 1        | 14             | 7        | 3                   | 3        | 14                  | 6        | 2                   | 2        | 4         | 1        | 6                     | 1        | 2                         | 1        | 5        | 6        | 6              |             |        | 49      | 39       |
| 1852     | 2          | 1        | 4         | 3        | ..                    | ..       | 1              | 1        | 1                   | 1        | 1                   | 3        | ..                  | 1        | 1         | ..       | 4                     | 4        | 3                         | 1        | 2        | 2        | 1              | 1852        | 18     | 17      |          |
| Totals.. | 8          | 9        | 13        | 16       | ..                    | 1        | 28             | 10       | 11                  | 26       | 5                   | 4        | 11                  | 5        | 18        | 7        | 3                     | 13       | 17                        | 15       | 14       |          |                | Grand Total | 116    | 123     |          |



TABLE XVIII.

Number of Deaths and Injuries from various causes among

GUARDS.

| Years.   | Collision. |          | Off Line. |          | Running into Station. |          | Axle Breaking. |          | Machinery Breaking. |          | Falling from Train. |          | Jumping from Train. |          | Run Over. |          | Collision at Station. |          | Mounting Train in Motion. |          | Crushed. |          | Miscellaneous. |          | Years.      | Total.  |          |
|----------|------------|----------|-----------|----------|-----------------------|----------|----------------|----------|---------------------|----------|---------------------|----------|---------------------|----------|-----------|----------|-----------------------|----------|---------------------------|----------|----------|----------|----------------|----------|-------------|---------|----------|
|          | Killed.    | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.        | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.                   | Injured. | Killed.  | Injured. | Killed.        | Injured. |             | Killed. | Injured. |
| 1840     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | ..       | ..                  | ..       | ..        | 1        | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | 1        | 1840        | ..      | 2        |
| 1841     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | ..        | ..       | ..                    | ..       | ..                        | ..       | ..       | ..       | ..             | ..       | 1841        | 1       | 5        |
| 1842     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | ..       | ..                  | ..       | ..        | 1        | ..                    | ..       | ..                        | ..       | ..       | ..       | 1              | 1842     | 7           | 2       |          |
| 1843     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 4                   | 1        | ..                  | ..       | ..        | ..       | ..                    | ..       | ..                        | ..       | ..       | ..       | 1              | 1843     | 5           | 2       |          |
|          | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 5                   | 5        | 1                   | ..       | 1         | 1        | ..                    | ..       | ..                        | ..       | 1        | 2        | 3              |          | 11          |         |          |
| 1844     | ..         | 1        | ..        | ..       | ..                    | ..       | ..             | ..       | 1                   | ..       | 1                   | ..       | ..                  | ..       | ..        | ..       | ..                    | ..       | ..                        | ..       | ..       | ..       | 4              | 1844     | 5           | 6       |          |
| 1845     | ..         | 1        | ..        | 2        | ..                    | ..       | ..             | ..       | ..                  | ..       | 4                   | 2        | ..                  | ..       | ..        | ..       | ..                    | ..       | ..                        | ..       | ..       | ..       | 2              | 1845     | 6           | 7       |          |
| 1846     | ..         | ..       | ..        | 3        | ..                    | ..       | ..             | ..       | 1                   | ..       | 4                   | 1        | ..                  | ..       | 2         | ..       | 1                     | ..       | ..                        | ..       | 1        | ..       | 2              | 1846     | 9           | 9       |          |
| 1847     | 2          | 1        | 1         | 1        | ..                    | ..       | ..             | ..       | ..                  | ..       | 2                   | 2        | ..                  | ..       | ..        | 1        | 2                     | ..       | ..                        | ..       | 1        | 2        | ..             |          | 1847        | 10      | 9        |
|          | 2          | 3        | 1         | 6        | ..                    | ..       | ..             | ..       | 2                   | ..       | 11                  | 5        | ..                  | ..       | 3         | 1        | 3                     | 1        | 1                         | ..       | 2        | 3        | 8              |          | 31          |         |          |
| 1848     | ..         | 3        | 2         | 1        | ..                    | ..       | ..             | ..       | ..                  | 2        | 4                   | 1        | 1                   | ..       | 2         | ..       | ..                    | 1        | ..                        | ..       | 1        | ..       | 2              | 1848     | 22          | 10      |          |
| 1849     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | 1        | 6                   | 4        | ..                  | ..       | 1         | ..       | ..                    | ..       | 1                         | ..       | 1        | 4        | 4              | 1849     | 15          | 14      |          |
| 1850     | 1          | ..       | ..        | ..       | 1                     | ..       | ..             | ..       | 1                   | 1        | 8                   | ..       | ..                  | ..       | 3         | 1        | ..                    | 4        | 2                         | ..       | 3        | 1        | 5              | 1850     | 21          | 15      |          |
| 1851     | ..         | ..       | ..        | 1        | ..                    | ..       | ..             | ..       | ..                  | ..       | 2                   | ..       | ..                  | ..       | 2         | ..       | 2                     | ..       | ..                        | ..       | 5        | ..       | 2              | 1851     | 14          | 3       |          |
|          | 1          | 3        | 2         | 2        | 1                     | ..       | ..             | ..       | 4                   | 1        | 20                  | 5        | 1                   | ..       | 8         | 1        | 3                     | 5        | 3                         | 9        | 10       | 13       |                |          | 42          |         |          |
| 1852     | ..         | 2        | 3         | 3        | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | 2        | ..                  | ..       | 1         | 1        | ..                    | ..       | ..                        | ..       | 1        | 2        | 6              | 1852     | 12          | 16      |          |
| Totals.. | 3          | 8        | 6         | 11       | 1                     | ..       | ..             | ..       | 1                   | 6        | 37                  | 17       | 2                   | ..       | 13        | 4        | 4                     | 8        | 10                        | 3        | 14       | 12       | 30             |          | Grand Total | 127     | 100      |



*Number of Deaths and Injuries from various causes among*  
PORTERS.

| Years.   | Collision. |          | Off Line. |          | Running into Station. |          | Axle Breaking. |          | Machinery Breaking. |          | Falling from Train. |          | Jumping from Train. |          | Run over. |          | Collision at Station. |          | Mounting Train in motion. |             | Crushed. |          | Miscellaneous. |          | Years. | Total.  |          |
|----------|------------|----------|-----------|----------|-----------------------|----------|----------------|----------|---------------------|----------|---------------------|----------|---------------------|----------|-----------|----------|-----------------------|----------|---------------------------|-------------|----------|----------|----------------|----------|--------|---------|----------|
|          | Killed.    | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.        | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.                   | Injured.    | Killed.  | Injured. | Killed.        | Injured. |        | Killed. | Injured. |
| 1840     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | ..       | ..                  | 1        | ..        | ..       | 1                     | ..       | ..                        | ..          | ..       | ..       | ..             | ..       | 1840   | 1       | ..       |
| 1841     | ..         | ..       | ..        | ..       | 1                     | 1        | ..             | 1        | ..                  | ..       | 1                   | ..       | ..                  | 1        | ..        | 1        | ..                    | ..       | ..                        | ..          | ..       | ..       | ..             | ..       | 1841   | 4       | 3        |
| 1842     | ..         | ..       | ..        | ..       | 1                     | 1        | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | ..        | ..       | ..                    | ..       | ..                        | 1           | ..       | ..       | ..             | ..       | 1842   | 3       | 2        |
| 1843     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | ..        | ..       | ..                    | ..       | ..                        | ..          | 3        | ..       | 1              | ..       | 1843   | 8       | 4        |
|          | ..         | ..       | ..        | ..       | 3                     | 2        | 1              | ..       | ..                  | ..       | 2                   | 1        | ..                  | 2        | 1         | 2        | 1                     | ..       | 6                         | 3           | 2        | 1        | 1              | 1        |        | 16      | 9        |
| 1844     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | ..                  | 1        | ..                  | ..       | 3         | 1        | ..                    | ..       | 2                         | ..          | 1        | ..       | 1              | 1        | 1844   | 6       | 4        |
| 1845     | ..         | ..       | ..        | ..       | 1                     | ..       | 1              | ..       | ..                  | ..       | 1                   | ..       | 1                   | ..       | 1         | 1        | ..                    | 1        | 1                         | ..          | 1        | ..       | ..             | ..       | 1845   | 6       | 2        |
| 1846     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 1                   | ..       | 1                   | ..       | 1         | ..       | 4                     | 1        | 4                         | ..          | 1        | ..       | ..             | ..       | 1846   | 7       | 7        |
| 1847     | ..         | ..       | ..        | ..       | 3                     | ..       | ..             | ..       | ..                  | ..       | ..                  | ..       | ..                  | ..       | 5         | 1        | ..                    | ..       | 3                         | 1           | 1        | ..       | 2              | ..       | 1847   | 12      | 4        |
|          | ..         | ..       | ..        | ..       | 4                     | ..       | 3              | ..       | ..                  | ..       | 7                   | 5        | 2                   | 4        | 1         | ..       | 10                    | 3        | 4                         | 4           | 3        | 4        | 4              | 4        |        | 31      | 17       |
| 1848     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 3                   | ..       | ..                  | 1        | ..        | ..       | ..                    | ..       | 4                         | 1           | 4        | ..       | 1              | 1        | 1848   | 10      | 6        |
| 1849     | ..         | ..       | ..        | ..       | 1                     | 1        | ..             | 1        | ..                  | ..       | 6                   | ..       | 1                   | ..       | ..        | ..       | ..                    | ..       | 4                         | ..          | 3        | 4        | 4              | 4        | 1849   | 13      | 8        |
| 1850     | ..         | ..       | ..        | ..       | 1                     | ..       | ..             | ..       | ..                  | ..       | 4                   | 1        | ..                  | ..       | ..        | ..       | ..                    | ..       | 2                         | ..          | 1        | 3        | 3              | 3        | 1850   | 9       | 5        |
| 1851     | ..         | ..       | ..        | ..       | ..                    | 2        | ..             | ..       | ..                  | ..       | 3                   | ..       | ..                  | 1        | ..        | ..       | 1                     | 1        | 8                         | 1           | 2        | 5        | 5              | 5        | 1851   | 19      | 11       |
|          | ..         | ..       | ..        | ..       | 2                     | 3        | 1              | ..       | ..                  | ..       | 16                  | ..       | 1                   | 1        | 4         | 2        | 18                    | 10       | 8                         | 13          | 13       | 8        | 13             | 13       |        | 51      | 30       |
| 1852     | ..         | ..       | ..        | ..       | 1                     | ..       | ..             | ..       | ..                  | ..       | 6                   | 1        | 1                   | 1        | 2         | ..       | 7                     | 1        | 1                         | 3           | 2        | 1        | 3              | 3        | 1852   | 19      | 9        |
| Totals.. | ..         | ..       | 1         | 2        | 10                    | 5        | 6              | 2        | 31                  | 7        | 4                   | 7        | 9                   | 3        | 41        | 18       | 15                    | 21       | 117                       | Grand Total |          |          |                |          |        |         | 65       |



TABLE XX.

OTHER SERVANTS.

| Years.   | Collision. |          | Off Line. |          | Running into Station. |          | Axle Breaking. |          | Machinery Breaking. |          | Falling from Train. |          | Jumping from Train. |          | Run over. |          | Collision at Station. |          | Mounting Train in motion. |             | Crushed. |          | Miscellaneous. |          | Years. | Total.  |          |
|----------|------------|----------|-----------|----------|-----------------------|----------|----------------|----------|---------------------|----------|---------------------|----------|---------------------|----------|-----------|----------|-----------------------|----------|---------------------------|-------------|----------|----------|----------------|----------|--------|---------|----------|
|          | Killed.    | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.        | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.             | Injured. | Killed.   | Injured. | Killed.               | Injured. | Killed.                   | Injured.    | Killed.  | Injured. | Killed.        | Injured. |        | Killed. | Injured. |
| 1840     | ..         | ..       | ..        | ..       | ..                    | ..       | ..             | ..       | ..                  | ..       | 2                   | 1        | 9                   | 2        | ..        | ..       | ..                    | ..       | ..                        | ..          | 2        | 3        | ..             | 8        | 1840   | 12      | 8        |
| 1841     | ..         | ..       | ..        | 1        | ..                    | ..       | ..             | ..       | ..                  | ..       | 11                  | 2        | 19                  | 11       | ..        | ..       | ..                    | ..       | ..                        | ..          | 3        | 3        | 1              | 18       | 1841   | 23      | 18       |
| 1842     | ..         | 2        | ..        | ..       | 3                     | ..       | ..             | ..       | ..                  | ..       | 11                  | 1        | 17                  | 11       | ..        | ..       | ..                    | ..       | ..                        | ..          | ..       | 2        | 1              | 22       | 1842   | 27      | 22       |
| 1843     | ..         | 1        | ..        | ..       | 5                     | ..       | ..             | ..       | ..                  | ..       | 4                   | ..       | 11                  | 4        | ..        | ..       | ..                    | ..       | ..                        | ..          | 4        | 2        | 2              | 13       | 1843   | 21      | 13       |
|          | ..         | 3        | ..        | 1        | 9                     | ..       | ..             | ..       | ..                  | ..       | 28                  | 8        | 6                   | 4        | 56        | 28       | ..                    | ..       | 1                         | 4           | 9        | 10       | 3              | 61       |        | 83      | 61       |
| 1844     | ..         | 5        | 1         | 1        | 4                     | ..       | ..             | ..       | ..                  | ..       | 16                  | 3        | 19                  | 1        | 16        | 1        | 1                     | ..       | 1                         | 1           | ..       | 1        | 4              | 17       | 1844   | 28      | 17       |
| 1845     | 1          | 1        | 9         | 9        | 5                     | ..       | ..             | ..       | ..                  | ..       | 5                   | 1        | 19                  | 5        | 38        | 5        | ..                    | ..       | 2                         | 2           | 1        | 2        | 1              | 23       | 1845   | 36      | 23       |
| 1846     | 1          | 10       | 2         | 2        | 2                     | ..       | ..             | ..       | ..                  | ..       | 42                  | 3        | 42                  | 8        | 38        | 8        | 1                     | 1        | 2                         | 2           | 3        | 2        | 2              | 35       | 1846   | 61      | 35       |
| 1847     | ..         | ..       | 4         | 4        | 6                     | ..       | ..             | ..       | ..                  | ..       | 14                  | 2        | 38                  | 14       | ..        | 1        | 1                     | ..       | ..                        | ..          | 8        | 1        | 5              | 31       | 1847   | 67      | 31       |
|          | 2          | 16       | 5         | 16       | ..                    | ..       | 2              | 2        | 4                   | 3        | 115                 | 11       | 28                  | 28       | 115       | 28       | 1                     | 2        | 13                        | 5           | 12       | 6        | 12             | 106      |        | 192     | 106      |
| 1848     | 1          | 10       | ..        | ..       | 10                    | 3        | ..             | ..       | 3                   | 3        | 45                  | 1        | 4                   | 4        | 25        | 4        | 1                     | 1        | 6                         | 3           | 14       | 5        | 3              | 33       | 1848   | 86      | 33       |
| 1849     | 1          | 3        | ..        | ..       | 5                     | 1        | ..             | ..       | 1                   | 1        | 41                  | 2        | 1                   | 1        | 41        | 1        | ..                    | ..       | 6                         | 5           | 9        | 8        | 17             | 41       | 1849   | 82      | 41       |
| 1850     | 1          | ..       | ..        | ..       | 3                     | 1        | ..             | ..       | 1                   | 1        | 39                  | 3        | ..                  | ..       | 39        | ..       | 1                     | 1        | 3                         | 2           | 13       | 1        | 13             | 22       | 1850   | 79      | 22       |
| 1851     | 1          | ..       | 1         | ..       | 8                     | 1        | ..             | 2        | 1                   | 1        | 25                  | 1        | 3                   | 3        | 25        | 3        | ..                    | ..       | 3                         | 4           | 9        | 4        | 6              | 21       | 1851   | 63      | 21       |
|          | 4          | 13       | 1         | ..       | 26                    | 7        | 1              | 2        | 6                   | 6        | 150                 | 7        | 8                   | 150      | 8         | 8        | 7                     | 2        | 18                        | 14          | 45       | 18       | 39             | 117      |        | 310     | 117      |
| 1852     | 5          | 2        | ..        | ..       | 4                     | 1        | ..             | ..       | 1                   | 1        | 32                  | ..       | 6                   | 32       | 6         | 6        | ..                    | 6        | 3                         | ..          | 6        | ..       | 16             | 37       | 1852   | 63      | 37       |
| Totals.. | 11         | 34       | 6         | 17       | 56                    | 24       | 21             | 353      | 70                  | 8        | 10                  | 35       | 23                  | 72       | 34        | 74       | 70                    | 648      | 321                       | Grand Total |          |          |                |          |        |         |          |



The preceding eight Tables have been given in the present very complete form, so as to permit other inquirers who may happen to take a different view of the manner in which the subject should be treated, to make new combinations for themselves. The following Table, XXI, on next page, shews, for three different periods of years, the ratio of the mortality per cent. from each cause to the mortality from all causes; and, so far as passengers are concerned, some of the results are rather curious.

It will be seen from the first section of this Table, that the deaths of passengers from collisions, and from trains running off the line, which constitute a large portion of the whole, have been gradually diminishing, while deaths from passengers falling from the trains have scarcely varied. Again, the deaths from axles breaking, in the four years 1840-3, formed 8 per cent. of the whole deaths in that period; but, since the year 1844, not a single death of a passenger has taken place assignable to that cause. And in regard to deaths from the breaking of other parts of the machinery none have happened since 1847.

In the latter part of 1840, the death of one passenger was occasioned by the running of a train into the station; but no other since that time, although 21 have been injured from the same cause at different periods. The deaths of passengers from collisions at stations increased subsequent to 1843, and have since remained nearly uniform at about 15 per cent. of the deaths from all causes.

The deaths occasioned by passengers jumping from trains while in motion have increased in a very remarkable manner ever since 1840, as well as the deaths from passengers mounting trains while in motion.

Results of the kind now enumerated, although given in strict accordance with the methods of many statistical inquirers, are, if given in such form only, liable to a serious objection, for in every case where the intensity of a variety of causes is being measured, the pressure of any one or more of the causes might actually be remaining constant, while the form of the preceding Table is capable of making them appear as increasing or decreasing in intensity: and *vice versâ*, the intensity of the same causes might in reality be undergoing great modifications, and at the same time appear uniform in the Table. An attentive consideration of the principle on which the Table is constructed will shew this to be the case; and the actual facts contained in it furnish an excellent illustration of these remarks. It will be seen that, in the period 1848-51, no deaths have taken place among passengers from the causes placed third, fourth, and fifth in order; and the immediate effect of the exclusion of deaths from these causes is to give an apparent augmentation of intensity to the remaining causes in operation in that period; a similar effect would also be produced, although not in degree the same, by any fluctuations whatever in the intensity of one or more of the causes. The proper use of such a Table as that now under consideration, is to direct attention to the fact of disturbing causes being in operation, but not to measure the degree or the exact amount of the intensity of each cause; which must be determined by a different method.

It is not easy, in a short paper, to follow a course of argument keeping clearly in view the many fluctuations in the ratio of deaths among a great variety of causes; but it  
[is obvious



TABLE XXI.

*Ratio of Mortality per Cent. from each cause, to the Mortality from all causes, among each Class of Persons.*

| CAUSE.                             | Passengers. |          |          | Public by their own Negligence. |          |          | Trespassers. |          |          | Engine Drivers. |          |          |
|------------------------------------|-------------|----------|----------|---------------------------------|----------|----------|--------------|----------|----------|-----------------|----------|----------|
|                                    | 1840-43.    | 1844-47. | 1848-51. | 1840-43.                        | 1844-47. | 1848-51. | 1840-43.     | 1844-47. | 1848-51. | 1840-43.        | 1844-47. | 1848-51. |
| Collision . . . . .                | 11.48       | 16.18    | 7.48     | ...                             | ...      | ...      | ...          | ...      | ...      | ...             | 14.29    | 7.41     |
| Off line . . . . .                 | 22.95       | 7.35     | 14.95    | ...                             | ...      | ...      | ...          | ...      | ...      | ...             | 39.29    | 18.52    |
| Running into station . . . . .     | 1.64        | ...      | ...      | ...                             | ...      | ...      | ...          | ...      | ...      | 14.28           | ...      | ...      |
| Axle breaking . . . . .            | 8.19        | 1.47     | ...      | ...                             | ...      | ...      | ...          | ...      | ...      | ...             | ...      | ...      |
| Machinery ditto . . . . .          | ...         | 2.94     | ...      | ...                             | ...      | ...      | ...          | ...      | ...      | ...             | ...      | ...      |
| Falling from train . . . . .       | 6.56        | 7.35     | 6.54     | ...                             | ...      | ...      | ...          | ...      | ...      | ...             | ...      | 18.52    |
| Jumping from ditto . . . . .       | 4.92        | 20.60    | 14.02    | ...                             | 10.00    | ...      | 12.82        | 2.35     | ...      | 42.86           | 10.71    | 11.11    |
| Run over . . . . .                 | 1.64        | 1.47     | 14.95    | ...                             | 73.33    | ...      | ...          | ...      | ...      | ...             | 7.14     | ...      |
| Collision at station . . . . .     | 9.84        | 16.18    | 14.95    | ...                             | ...      | ...      | 79.49        | 94.12    | 84.61    | 14.28           | 10.71    | ...      |
| Mounting train in motion . . . . . | 8.19        | 11.76    | 14.95    | ...                             | 1.67     | ...      | ...          | 3.53     | ...      | ...             | 7.15     | 3.70     |
| Crushed . . . . .                  | 3.28        | 2.94     | .94      | ...                             | 1.67     | ...      | 2.56         | ...      | 4.90     | 14.29           | ...      | 7.41     |
| Miscellaneous . . . . .            | 21.31       | 11.76    | 11.22    | ...                             | 6.66     | 20.97    | 5.13         | ...      | 4.90     | ...             | ...      | 11.11    |
|                                    |             |          |          |                                 |          |          |              |          |          |                 | 10.71    | 22.22    |

| CAUSE.                             | Stokers. |          |          | Guards.  |          |          | Porters. |          |          | Other Servants. |          |          |
|------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------------|----------|----------|
|                                    | 1840-43. | 1844-47. | 1848-51. | 1840-43. | 1844-47. | 1848-51. | 1840-43. | 1844-47. | 1848-51. | 1840-43.        | 1844-47. | 1848-51. |
| Collision . . . . .                | 14.29    | 4.76     | 6.12     | ...      | 6.67     | 1.39     | ...      | ...      | ...      | ...             | 1.04     | 1.29     |
| Off line . . . . .                 | ...      | 9.52     | 10.21    | ...      | 3.33     | 2.78     | ...      | ...      | 1.96     | ...             | 2.60     | .32      |
| Running into station . . . . .     | ...      | ...      | ...      | ...      | ...      | ...      | ...      | ...      | ...      | ...             | ...      | ...      |
| Axle breaking . . . . .            | ...      | ...      | ...      | ...      | ...      | ...      | ...      | ...      | ...      | ...             | ...      | ...      |
| Machinery ditto . . . . .          | ...      | 7.14     | 14.28    | ...      | ...      | 1.39     | ...      | ...      | ...      | ...             | 1.04     | .64      |
| Falling from train . . . . .       | 28.57    | 26.20    | 28.57    | 38.46    | 36.67    | 27.77    | 18.75    | 12.90    | 3.92     | 10.84           | 8.86     | 8.39     |
| Jumping from ditto . . . . .       | ...      | 7.14     | 4.08     | 7.69     | ...      | 1.39     | 6.25     | 9.68     | 1.96     | 7.23            | 5.73     | 2.26     |
| Run over . . . . .                 | 42.85    | 7.14     | 8.16     | 7.69     | 10.00    | 11.11    | 12.50    | 22.58    | 31.37    | 67.47           | 59.90    | 48.39    |
| Collision at station . . . . .     | ...      | 4.76     | 4.08     | ...      | 3.33     | 4.17     | ...      | 6.45     | 1.96     | ...             | .52      | 2.26     |
| Mounting train in motion . . . . . | 14.29    | 2.38     | 4.08     | ...      | 3.33     | 12.50    | 12.50    | 3.23     | 7.84     | 1.21            | 6.77     | 5.81     |
| Crushed . . . . .                  | ...      | 11.91    | 10.21    | 7.70     | 6.67     | 13.89    | 37.50    | 32.26    | 35.30    | 10.84           | 6.25     | 14.51    |
| Miscellaneous . . . . .            | ...      | 19.05    | 10.21    | 38.46    | 30.00    | 23.61    | 12.50    | 12.90    | 15.69    | 2.41            | 5.21     | 15.81    |



is obvious that a number of the circumstances, under which railway accidents have taken place, are for many purposes susceptible of the very simple classification already more than once alluded to.

A large number of the deaths are assignable to causes over which it is evident the directors and managers have little, if any, control, such as—

- (a) Passengers mounting trains while in motion.
- (b) Passengers jumping from trains while in motion.
- (c) Passengers falling from trains while in motion.
- (d) Axles breaking.
- (e) Machinery breaking.
- (f) Passengers being run over.

And if all the remaining causes in the preceding Tables were placed to the credit of the management of railways, and held as coming in some measure under the control of the railway officers and servants of the companies, little exception can be taken to the classification on the ground that it is calculated to underrate their responsibilities.

The following Abstract will shew the results thus arrived at:—

#### ABSTRACT I.

| CAUSES.                                                                 | Number of Passengers. |          |
|-------------------------------------------------------------------------|-----------------------|----------|
|                                                                         | Killed.               | Injured. |
| (A) Beyond control of the Companies . . . . .                           | 119                   | 171      |
| (B) Under control of the Companies, (including miscellaneous group) . . | 147                   | 1,625    |
| Ratio per cent. of (A) to the whole . . . . .                           | 44·7                  | 9·5      |
| Ratio per cent. of (B) to the whole . . . . .                           | 55·3                  | 90·5     |

It will thus be seen, that about 44·7 per cent. of all the deaths has taken place from causes over nearly all of which the passengers themselves have control, the exception being the eight deaths included in causes (d) and (e), and for which the companies can scarcely be in any way held responsible. But in regard to the injuries, 9·5 per cent. only of the accidents are so circumstanced, which calls attention to a very remarkable feature in the results now under consideration.

- (a) The deaths from causes beyond the control of the companies form 69·6 per cent. of the number of injuries from the same causes.
- (b) The deaths from causes under the control of the companies are 9 per cent. of the number of injuries from the same causes; and

Hence the tendency of accidents, which may be considered to arise from details of management, is to inflict bodily injury rather than to occasion death; for in respect to every 100 injuries, 9 deaths take place from corresponding causes, while among the accidents due to causes within the influence of the passengers themselves, for every 100 injuries nearly 70 deaths occur.

This method of stating the results naturally leads to the inquiry, Do the accidents,



falling within the class of causes assumed to come under the control of the companies, increase or diminish?

The classification in Abstract I, it will be seen, includes the deaths of the miscellaneous groups in Tables IV to XI inclusive, and also those in Tables XIII to XX inclusive, as coming under the control of the companies; but it must be obvious, that some of these accidents will be due to causes over which the companies cannot be supposed to have any control whatever. The more correct comparison will therefore evidently be that between ascertained causes only; and the following Abstract is so corrected:—

ABSTRACT J.

| CAUSES.                        | Deaths of Passengers during |                       |            |                       |            |                       |
|--------------------------------|-----------------------------|-----------------------|------------|-----------------------|------------|-----------------------|
|                                | 1840—43.                    |                       | 1844—1847. |                       | 1848—1851. |                       |
|                                | Number.                     | Per-Centage of Total. | Number.    | Per-Centage of Total. | Number.    | Per-Centage of Total. |
| Beyond control of Companies .  | 18                          | 37·50                 | 31         | 51·67                 | 54         | 56·84                 |
| Under control of Companies . . | 30                          | 62·50                 | 29         | 48·33                 | 41         | 43·16                 |

It will thus be seen, that the deaths from causes under the control of the companies have, in reference to the total deaths from all causes, been gradually diminishing ever since 1840.

|                       |                                                                 |   |                                      |
|-----------------------|-----------------------------------------------------------------|---|--------------------------------------|
| In the period 1840—43 | } the deaths from all causes under the control of the Companies | { | = 62·50 per cent. of all the deaths. |
| ... 1844—47           |                                                                 |   | = 48·33                              |
| ... 1848—51           |                                                                 |   | = 43·16                              |

So that it is evident, that the class of accidents under the control of the several companies is decreasing in relation to the total accidents in a most satisfactory and very rapid manner.

In order to avoid the objections which might be urged against the preceding mode of comparison, prominently referred to in speaking of Table XXI preceding, the following arrangement of the facts is given, which is faultless as a test, but establishes the same conclusion arrived at from a consideration of Abstract J.

ABSTRACT K.

| CAUSES.                                         | Period of Observation. |                  |                  |
|-------------------------------------------------|------------------------|------------------|------------------|
|                                                 | 1840—43.               | 1844—47.         | 1848—51.         |
| Number of Passengers. . . . .                   | 57,617,587             | 156,698,002      | 264,173,027      |
| Deaths from Causes beyond control of Companies  | 18                     | 31               | 54               |
| Deaths from causes under control of Companies . | 30                     | 29               | 41               |
| Ratio of deaths beyond control of Companies . . | One in 3,200,977       | One in 5,054,774 | One in 4,892,093 |
| Ratio of deaths under control of Companies . .  | 1,920,585              | 5,403,379        | 6,443,244        |



There is here evidence, not only of a great diminution of all kinds of accidents to passengers, but, what is exceedingly satisfactory, of those accidents which are due to causes assumed to be under the control of the companies, in a very remarkable degree compared with the remaining class of accidents.

For while deaths from causes beyond the control of the companies have, between the periods of 1840-43 and 1848-51, diminished in the ratio of 49 to 30, those from causes under the control of the companies have diminished in the ratio of 64 to 19. This result is certainly one not generally understood by the public, for not only are all railway accidents supposed to be very much on the increase, but, those due to details of management, are believed to be rapidly and alarmingly so. The facts of the case do not support this view, for they disclose the truth, that railway management, so far as accidents producing deaths among passengers are concerned, has greatly improved, and apparently in a high and steady ratio.

|                       |                                                                |                                |               |
|-----------------------|----------------------------------------------------------------|--------------------------------|---------------|
| In the period 1840-43 | } the deaths from causes under the control<br>of the Companies | = One in 1,920,585 Passengers. |               |
| ... 1844-47           |                                                                | = ...                          | 5,403,379 ... |
| ... 1848-51           |                                                                | = ...                          | 6,443,244 ... |

So that this class of accidents has diminished to about 30 per cent. of its frequency and magnitude in the year 1843.

These results, viewed in connection with those of Abstract H, give birth to some interesting considerations. If regard be had to the causes of railway accidents, so far as they can be controlled by the companies, it is obvious that the increasing extent and complicated system of the railway communication, as it now exists in its ramified arteries over the country, together with the modifications in passenger traffic of recent years, enumerated in Clauses 1st, 2nd, and 3rd, of page 238, would, unless greatly improved management were keeping pace with the growing extent of railway traffic, lead to an immense increase in the number of accidents, not only absolutely, but relatively to the amount of that traffic.

If, therefore, the results of Abstracts H and K be borne in mind, which shew that the loss of life among passengers, from all causes, has decreased in recent years, and that at the same time, the class of deaths which have taken place from causes under the control of the companies, has, in relation to the whole of these reduced deaths, been subject, year after year, to a greatly increased rate of reduction (as shewn in Abstract K), every one, notwithstanding the present popular outcry, must be satisfied that means and influences are actively at work which are daily increasing the safety of life in railway travelling. Whether this change be due to the better general regulations enforced by the directors of the companies, or to the improved skill and intelligence of their officers and servants, still the results of this inquiry afford the most striking testimony to the recent improvement and increased safety in railway travelling; and encourage the hope that the same means will be persevered in to effect a still further reduction in the frequency and intensity of railway accidents.



An inspection of Tables XIII and XXI will shew the relative number of deaths arising from each cause; and, in regard to those accidents supposed to be under the control of the companies, the most important are those under the head of collisions and running off the line. It has been said of late, that the great bulk of all the railway accidents is due to collisions; but an inspection of Table XXI will shew that—

Collisions at stations constitute 15·0 per cent. of the whole deaths among passengers.

Other collisions, not at stations, 7·5

In all . . . . . 22·5 per cent. of the whole deaths among passengers.

When, however, we arrive at that point of this inquiry in which the rate of deaths of all classes of persons, including employés, is considered, it will be found, that of a total of 1828 deaths, not more than 119, or not one-fifteenth, has been occasioned by collisions of all sorts. Collisions do not, therefore, appear to affect railway servants so much as other causes. As they form, however, more than a moiety of all the accidents assignable to causes under the control of the companies, it may be important to view this group of casualties by itself. And the following Abstract will shew the ratio of collisions in different periods:—

#### ABSTRACT L.

| PERIOD.   | Number<br>of Passengers. | Collisions, not at Stations. |              | Collisions at Stations. |              |
|-----------|--------------------------|------------------------------|--------------|-------------------------|--------------|
|           |                          | Number<br>of Killed.         | Being one in | Number<br>of Killed.    | Being one in |
| 1840-43   | 57,617,578               | 7                            | 8,231,082    | 6                       | 9,602,929    |
| 1844-47   | 156,698,002              | 11                           | 14,245,273   | 11                      | 14,245,273   |
| 1848-51   | 264,173,027              | 8                            | 33,021,628   | 16                      | 10,510,814   |
| 1840—1851 | 478,488,607              | 26                           | 18,403,408   | 33                      | 14,499,655   |

An examination of the fourth and sixth columns of this Abstract shews, that even this class of accidents, on which so much importance has been placed, is rapidly diminishing in amount, the deaths by collisions at stations having, in the last period of observations above enumerated, decreased to about 58 per cent. of the ratio in the first period; and those by other collisions having actually been reduced in the most recent period to only 25 per cent. of their ratio in the earliest period. These results are of great importance; and while they are very satisfactory in shewing a diminution of deaths from all kinds of collisions, they are further practically useful in proving, that while the deaths have been reduced to one-fourth in one group of collisions, they have undergone a reduction to the extent of 42 per cent. only in the collisions at stations. This ought to awaken attention to the latter group of accidents; and those entrusted with the general superintendence of the stations should have the subject forced upon their notice.

Collisions of railway trains being one of the many causes of accidents which come so obviously under the control and management of the companies, they have been thought of sufficient importance to justify a very minute analysis of them, with the view of pointing



out the peculiar circumstances under which they usually take place, in order to be suggestive of means for their prevention for the future.

In this part of the inquiry, it has been found impossible to pursue the subject further back than the beginning of 1844; and, therefore, the observations will be confined to the nine years 1844–52 inclusive. Collisions, as may be easily supposed, take place under a great variety of circumstances; and it is often a difficult matter to arrange them under any well defined system of classification; consequently, in the following Tables, such cases only were included in the respective groups, as distinctly and unmistakeably contained some common and important characteristic, and all anomalous cases are, therefore, placed in a miscellaneous group by themselves.

Heretofore, in using the word accidents, it has meant accident to life, and has been used synonymously with “loss of life” or death; but many collisions take place unattended with fatal consequences; and, although we shall hereafter shew the loss of life consequent on each kind of collision, still it is important to discuss, in the first place, the conditions under which collisions of various kinds do take place,—therefore, in the following Table, XXII, no notice is taken of the number of persons killed and injured.

In treating of the deaths of passengers in the preceding part of this paper, it was assumed that all collisions were due to causes over which the company had control; but, in the following Table it will be seen, that of the 174 classified collisions, as many as 28 took place under circumstances which it is, to a very great degree, impossible to control, and, in fact, the collisions were of a nature, against which it would at all times be exceedingly difficult to use precautions which would effectually prevent them. They will be found in Section A of the following Table, and are all more or less accounted for by the state of the weather. Fog-signals, and some other appliances, might, in a few of these instances, be made available; but in the majority of the cases it is difficult to suggest a certain remedy.

Sections B and C of this Table may be considered to embrace collisions, the causes of which are certainly, to a very great extent, completely under the control of the companies; and it must appear to every inquirer that, of the 34 collisions in Section B, the great bulk were absolutely preventable by a sufficient amount of care. For example, of the 18 collisions enumerated in columns (*a*), (*b*), (*c*), and (*d*) of this section, 15 are due to portions of the trains becoming detached, and three to defective “breaks;” and it is difficult to conceive any sufficient reason to justify a continuance or repetition of accidents from these causes. No doubt the couplings of carriages may, under extraordinary circumstances, be found to give way, even when great vigilance has been used; but such an excuse can be of no avail in the face of so many accidents of this kind as are now under consideration, and there certainly does appear strong reason to condemn the system of management which permits a series of collisions from these causes. Again, it will be found that no less than 16 collisions took place, owing to the trains having been retarded by accidents to some portion or other of the engine. It is, no doubt, sometimes difficult to determine  
[on inspection



TABLE XXII.

*An Analysis of Causes of Collisions on Railways in Great Britain and Ireland, from 1844 to 1852 inclusive.*

| Entirely, or to a very great extent, under Control of the Companies. |                                     |                                            |                                        |                                                                              |                                                            |                                                 |                                                                                    |                |                                                            |      |             |      |      |      |      |                                     |                        |                                                                                                                 |      |      |      |
|----------------------------------------------------------------------|-------------------------------------|--------------------------------------------|----------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------------|----------------|------------------------------------------------------------|------|-------------|------|------|------|------|-------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------|------|------|------|
| Year.                                                                | Not under control of the Companies. |                                            | Partly under Control.                  |                                                                              | D. Other Causes.                                           |                                                 |                                                                                    |                |                                                            |      |             |      |      |      |      |                                     |                        |                                                                                                                 |      |      |      |
|                                                                      | A. State of the Weather.            |                                            |                                        |                                                                              | B. Defects of Machinery.                                   |                                                 |                                                                                    |                |                                                            |      | C. Neglect. |      |      |      |      |                                     | D. Other Causes.       |                                                                                                                 |      |      |      |
|                                                                      | (a.)                                | (b.)                                       | (c.)                                   | (d.)                                                                         | Coupling Chains.                                           |                                                 |                                                                                    | Breaks.        |                                                            |      | Engine.     |      |      | (a.) | (b.) | (c.)                                | (d.)                   | (e.)                                                                                                            | (f.) | (a.) | (b.) |
|                                                                      | Fog or Storm.                       | Rails Slippery, (generally caused by Fog.) | Train retarded by Wind, and overtaken. | Waggons or Parts of Trains Blown on to Line. Generally Neglect of Pointsmen. | Part of Train coming detached on Incline and running back. | Part of Train coming detached and left on Line. | Train giving way in Middle. Hinder part running into Fore part by its own Impetus. | Faulty Breaks. | Train or Engine retarded or stopped by Accident to Engine. | (a.) | (b.)        | (c.) | (d.) | (e.) | (f.) | Train lost Speed and was overtaken. | Steam or Water Failed. | Miscellaneous, and not specified, but all attributable to Neglect on the part of the Servants of the Companies. |      |      |      |
| 1844                                                                 | 4                                   | 2                                          | 1                                      | 1                                                                            | ..                                                         | 1                                               | ..                                                                                 | 1              | 1                                                          | 1    | ..          | ..   | ..   | 1    | 3    | ..                                  | ..                     | 2                                                                                                               |      |      |      |
| 1845                                                                 | 1                                   | 1                                          | ..                                     | 2                                                                            | ..                                                         | ..                                              | ..                                                                                 | ..             | 1                                                          | 1    | 7           | ..   | ..   | ..   | 1    | 1                                   | ..                     | 11                                                                                                              |      |      |      |
| 1846                                                                 | 2                                   | ..                                         | ..                                     | ..                                                                           | ..                                                         | ..                                              | 1                                                                                  | 1              | 2                                                          | 3    | 6           | 1    | 1    | 1    | 3    | 2                                   | 1                      | 11                                                                                                              |      |      |      |
| 1847                                                                 | ..                                  | 3                                          | ..                                     | ..                                                                           | ..                                                         | 1                                               | ..                                                                                 | ..             | 3                                                          | 4    | 6           | 2    | 5    | 1    | 2    | ..                                  | 3                      | 10                                                                                                              |      |      |      |
| 1848                                                                 | ..                                  | ..                                         | ..                                     | ..                                                                           | 1                                                          | ..                                              | ..                                                                                 | ..             | 3                                                          | ..   | 7           | ..   | 3    | 1    | 2    | ..                                  | ..                     | 19                                                                                                              |      |      |      |
| 1849                                                                 | 1                                   | ..                                         | ..                                     | 1                                                                            | 2                                                          | 1                                               | ..                                                                                 | ..             | ..                                                         | 3    | 1           | ..   | 1    | ..   | 2    | ..                                  | 1                      | 15                                                                                                              |      |      |      |
| 1850                                                                 | 2                                   | ..                                         | ..                                     | 2                                                                            | 2                                                          | ..                                              | ..                                                                                 | ..             | ..                                                         | 2    | 6           | ..   | 1    | ..   | 1    | ..                                  | ..                     | 26                                                                                                              |      |      |      |
| 1851                                                                 | 1                                   | 1                                          | ..                                     | ..                                                                           | 1                                                          | 1                                               | 1                                                                                  | ..             | 5                                                          | 1    | 5           | ..   | 2    | ..   | 1    | ..                                  | ..                     | 19                                                                                                              |      |      |      |
| 1852                                                                 | ..                                  | 2                                          | ..                                     | 1                                                                            | ..                                                         | 1                                               | 2                                                                                  | 1              | 1                                                          | 2    | 9           | 1    | 2    | ..   | 1    | ..                                  | ..                     | 21                                                                                                              |      |      |      |
| Totals                                                               | 11                                  | 9                                          | 1                                      | 7                                                                            | 6                                                          | 5                                               | 4                                                                                  | 3              | 16                                                         | 18   | 47          | 4    | 15   | 4    | 16   | 3                                   | 5                      | 134                                                                                                             |      |      |      |



on inspection, the defects in the mechanism of an engine, still the collisions from this cause have been so many, that it is impossible to conceive that a due amount of scrutiny has been always exercised in the determination of the state of the locomotives. Greater precautions have of late years been taken to guard against this class of accidents, and greater knowledge also now exists as to what constitutes durability and efficiency in many parts of the machinery; it is, therefore, to be hoped, that still further improvements will, in these respects, yet take place, and prevent collisions from any such causes. In fact, an examination of column (*e*), Section B, of this Table is sufficient to shew, that during the last four years a marked improvement has taken place.

The collisions in the five years 1844-48, from the causes now under consideration = 10, and

In the four years 1849-52 . . . . . = 6

But in the former period, the extent of railway mileage was to that in the latter as 15,337 to 25,529, and consequently if this kind of collision had taken place in the latter period in the same ratio as in the former, the number would have been nearly 17, while, in fact, it amounted to only 6. And there appears no sufficient reason why this improvement should not continue until all such accidents, or nearly all, disappear.

The next Section, C, of this Table includes a class of collision of a most serious character, and of an alarming extent. It is, perhaps, impossible to bring any direct charge against the directors and superior officers, on account of the culpable neglect on the part of the inferior servants, to which these accidents are immediately due; but the very enormous extent of them should call forth some more effective system of supervision to enforce a faithful and certain observance of the regulations of the companies. Of the 174 collisions, of which the causes are classified in Table XXII, the extraordinary number of 104 have arisen out of what can be described as nothing but most culpable neglect.

18 are due either to the neglect or mismanagement of signals.

47 have arisen from drivers neglecting signals, and other kinds of careless driving.

4 are due to the omission of the use of the "break."

15 are owing to pointsmen neglecting their duty.

4 are owing to the neglect or carelessness of station masters. And

16 have been occasioned by the inexcusable neglect of leaving waggons and portions of trains on the line, when the same line was in use by other trains; this last cause has, however, nearly disappeared during the three years 1850-52, not more than one collision yearly having taken place.

In Section D, of the last Table XXII, it will be found that column (*c*) contains no less than 134 cases of collision, which it has been found impossible to classify in a satisfactory manner; but they are all attributable to neglect on the part of the servants of the companies.

The facts recorded in this Table are of grave importance; and, although the directors of railway companies have in recent years done an immense deal to protect passengers against loss of life and limb, they are still imperatively called on to take the subject of the frequently recurring collisions more thoroughly into consideration. When such most culpable neglect exists, as is evident by this Table, the public have a right to demand more complete protection.



The next Table to be considered is Table XXIII, which follows the same principles of classification as the Table immediately preceding, only that in addition, the number of deaths and injuries due to each kind of collision is specified, for *employés* as well as passengers.

From this Table a very clear notion may be formed of the danger to life and limb of passengers by collisions taking place from different causes. It would appear that—

|                                                                                                           |   |                           |     |     |
|-----------------------------------------------------------------------------------------------------------|---|---------------------------|-----|-----|
| (A) The 28 collisions, from causes assignable to the state of the weather, produced . . . . .             | } | 2 deaths and 69 injuries. |     |     |
| (B) The 34 collisions, from defects and breakage of machinery produced . . . . .                          |   | 11                        | ... | 208 |
| (C) The 104 collisions, arising from classified causes of neglect in railway servants, produced . . . . . | } | 21                        | ... | 305 |
| (E) And the 134 collisions arising from unclassified causes, produced . . . . .                           |   | 16                        | ... | 581 |

It hence follows, that in each of the above groups the ratios of deaths and injuries to passengers were as follows:—

|                                                                       |     |      |     |       |     |
|-----------------------------------------------------------------------|-----|------|-----|-------|-----|
| In group (A), each collision produced .071 deaths and 2.464 injuries. |     |      |     |       |     |
| ... (B),                                                              | ... | .324 | ... | 6.118 | ... |
| ... (C),                                                              | ... | .202 | ... | 2.933 | ... |
| ... (E),                                                              | ... | .119 | ... | 4.336 | ... |

And Group B, or collisions arising from defects and breakage of machinery, has evidently the greatest tendency to occasion not only death, but likewise injuries to passengers, in relation to the number of collisions. This is not quite in accordance with the features attendant on railway accidents generally, in which it will be observed that those causes usually most fatal to life are accompanied with a reduced ratio of injuries. This will appear in a strong light when the part of this inquiry, relating to *employés*, is considered.

An examination of the final columns of Table XXIII will shew that the ratio which the number of injuries bears to the number of deaths arising from collisions differs very widely from that from accidents from all causes, as exhibited in Abstract G, both as regards passengers and servants of the companies.

| Class of Accidents.                   | The Ratio of Injured to Killed. |                 |
|---------------------------------------|---------------------------------|-----------------|
|                                       | Passengers.                     | Employés.       |
| All causes in the aggregate . . . . . | 675.20 per cent.                | 65.03 per cent. |
| Collisions only . . . . .             | 2301.96 ...                     | 225.49 ...      |

It hence follows that the injuries greatly exceed the deaths amongst passengers in both of the above classes of accidents. On the other hand, the deaths amongst employés exceed the injuries from all causes in the aggregate; but in the class of collisions, the injuries, as with passengers, much exceed the number of deaths.

[Of the 308



TABLE XXIII.

*Shewing the Number of Deaths and Injuries, to Railway Employés and to Passengers, due to each cause of Collision, on the Railways of Great Britain and Ireland, from the year 1844 to the Year 1852, inclusive.*

| YEAR. | A.                                  |         |          |                         |         |          |                             |         |          |                         |         |          | B.                                |         |          |                         |         |          |                                          |         |          |                         |         |          | D.                      |         |          |                         |         |          | Neglect.                |         |          |                         |         |          |                         |         |          |                         |         |          | Grand Total. |     |     |     |     |     |                         |     |     |      |     |     |                         |     |     |     |     |     |      |     |     |     |     |     |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-------|-------------------------------------|---------|----------|-------------------------|---------|----------|-----------------------------|---------|----------|-------------------------|---------|----------|-----------------------------------|---------|----------|-------------------------|---------|----------|------------------------------------------|---------|----------|-------------------------|---------|----------|-------------------------|---------|----------|-------------------------|---------|----------|-------------------------|---------|----------|-------------------------|---------|----------|-------------------------|---------|----------|-------------------------|---------|----------|--------------|-----|-----|-----|-----|-----|-------------------------|-----|-----|------|-----|-----|-------------------------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|       | Weather.                            |         |          |                         |         |          | Total.                      |         |          |                         |         |          | Defects or Breakage of Machinery. |         |          |                         |         |          | Loss of Speed, or Steam or Water failed. |         |          |                         |         |          | C.                      |         |          |                         |         |          | E.                      |         |          |                         |         |          | Total.                  |         |          |                         |         |          |              |     |     |     |     |     |                         |     |     |      |     |     |                         |     |     |     |     |     |      |     |     |     |     |     |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|       | Not under Control of the Companies. |         |          |                         |         |          | Partly under their Control. |         |          |                         |         |          | Num-ber of Colli-sions.           |         |          |                         |         |          | Emp.                                     |         |          |                         |         |          | Pass.                   |         |          |                         |         |          | Num-ber of Colli-sions. |         |          |                         |         |          | Emp.                    |         |          |                         |         |          |              |     |     |     |     |     | Pass.                   |     |     |      |     |     | Num-ber of Colli-sions. |     |     |     |     |     | Emp. |     |     |     |     |     | Pass. |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|       | a, b, c,                            |         |          | d                       |         |          | Num-ber of Colli-sions.     |         |          | Emp.                    |         |          | Pass.                             |         |          | Num-ber of Colli-sions. |         |          | Emp.                                     |         |          | Pass.                   |         |          | Num-ber of Colli-sions. |         |          | Emp.                    |         |          | Pass.                   |         |          | Num-ber of Colli-sions. |         |          | Emp.                    |         |          | Pass.                   |         |          |              |     |     |     |     |     | Num-ber of Colli-sions. |     |     | Emp. |     |     | Pass.                   |     |     |     |     |     |      |     |     |     |     |     |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|       | Num-ber of Colli-sions.             | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions.     | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions.           | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions.                  | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. | Num-ber of Colli-sions. | Killed. | Injured. |              |     |     |     |     |     |                         |     |     |      |     |     |                         |     |     |     |     |     |      |     |     |     |     |     |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 1844  | 7                                   | ...     | 12       | 1                       | ...     | 12       | ...                         | ...     | 8        | ...                     | 1       | ...      | 12                                | 1       | ...      | 4                       | 1       | ...      | ...                                      | ...     | ...      | ...                     | ...     | ...      | ...                     | ...     | ...      | ...                     | ...     | ...      | ...                     | ...     | ...      | ...                     | ...     | ...      | ...                     | ...     | ...      | ...                     | ...     | ...      | ...          | ... | ... | ... | ... | ... | ...                     | ... | ... | ...  | ... | ... | ...                     | ... | ... | ... | ... | ... | ...  | ... | ... | ... | ... | ... | ...   | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... | ... |

The letters at the head of the columns refer to those in the Analysis of Causes of Collisions. The Accidents in col. A<sub>4</sub> would, probably, be always traceable to Neglect of Pointsmen. Those in col. D would be, in general, attributable to Neglect.—See Analysis of Causes.

A curious and very interesting analysis of railway collisions will be found in the two next succeeding Tables, XXIV and XXV.



TABLE XXIV.

*Shewing the Number of Collisions in each Year, from 1844 to 1852, inclusive, with Number of Employés and Passengers Killed and Injured thereby.*

| YEAR.  | a.<br>Passenger Trains into Passenger Trains. |           |          |             |          | b.<br>Passenger into Other Trains. |           |          |             |          | c.<br>Other into Passenger Trains. |           |          |             |          | d.<br>Other Trains into Other Trains. |           |          |             |          | Totals.               |           |          |             |          |
|--------|-----------------------------------------------|-----------|----------|-------------|----------|------------------------------------|-----------|----------|-------------|----------|------------------------------------|-----------|----------|-------------|----------|---------------------------------------|-----------|----------|-------------|----------|-----------------------|-----------|----------|-------------|----------|
|        | Number of Collisions.                         | Employés. |          | Passengers. |          | Number of Collisions.              | Employés. |          | Passengers. |          | Number of Collisions.              | Employés. |          | Passengers. |          | Number of Collisions.                 | Employés. |          | Passengers. |          | Number of Collisions. | Employés. |          | Passengers. |          |
|        |                                               | Killed.   | Injured. | Killed.     | Injured. |                                    | Killed.   | Injured. | Killed.     | Injured. |                                    | Killed.   | Injured. | Killed.     | Injured. |                                       | Killed.   | Injured. | Killed.     | Injured. |                       | Killed.   | Injured. | Killed.     | Injured. |
| 1844   | 4                                             | ...       | 5        | 3           | 34       | 10                                 | 1         | 2        | 2           | 17       | 3                                  | ...       | ...      | 7           | ...      | 1                                     | ...       | ...      | 2           | ...      | 18                    | 1         | 7        | 5           | 60       |
| 1845   | 4                                             | ...       | ...      | 1           | 6        | 13                                 | 1         | 3        | ...         | 24       | 8                                  | 1         | 2        | 3           | 36       | 2                                     | 1         | 2        | ...         | ...      | 27                    | 3         | 7        | 4           | 66       |
| 1846   | 2                                             | ...       | ...      | ...         | 3        | 19                                 | 1         | 14       | 2           | 39       | 3                                  | ...       | 3        | 1           | 35       | 11                                    | 1         | 11       | ...         | ...      | 35                    | 2         | 28       | 4           | 77       |
| 1847   | 6                                             | ...       | 1        | ...         | 17       | 18                                 | 2         | 3        | 9           | 19       | 3                                  | ...       | ...      | 5           | ...      | 13                                    | 4         | 5        | ...         | ...      | 40                    | 6         | 9        | 9           | 41       |
| 1848   | 7                                             | ...       | 2        | 1           | 23       | 17                                 | 5         | 11       | 6           | 62       | 6                                  | 1         | 2        | ...         | 18       | 6                                     | 1         | 7        | ...         | 2        | 36                    | 7         | 22       | 7           | 105      |
| 1849   | 4                                             | ...       | ...      | ...         | 13       | 14                                 | 1         | 1        | ...         | 16       | 3                                  | ...       | ...      | ...         | 36       | 7                                     | 5         | 6        | ...         | 1        | 28                    | 6         | 7        | ...         | 66       |
| 1850   | 8                                             | ...       | 1        | 5           | 52       | 16                                 | 3         | 7        | 1           | 55       | 13                                 | 5         | 1        | ...         | 29       | 5                                     | 2         | 5        | 2           | 1        | 42                    | 10        | 14       | 8           | 137      |
| 1851   | 7                                             | ...       | ...      | 6           | 156      | 23                                 | 5         | 3        | ...         | 80       | 6                                  | ...       | ...      | 3           | 65       | 2                                     | 2         | 1        | ...         | ...      | 38                    | 7         | 4        | 9           | 301      |
| 1852   | 6                                             | ...       | 1        | 2           | 25       | 26                                 | 2         | 14       | 2           | 243      | 6                                  | ...       | ...      | 1           | 53       | 6                                     | 7         | 2        | ...         | ...      | 44                    | 9         | 17       | 5           | 321      |
| Totals | 48                                            | ...       | 10       | 18          | 329      | 156                                | 21        | 58       | 22          | 555      | 51                                 | 7         | 8        | 8           | 284      | 53                                    | 23        | 39       | 3           | 6        | 308                   | 51        | 115      | 51          | 1,174    |



Of the 308 collisions recorded in Table XXIV, it will be found that—

- (a.) 48 have consisted of one passenger train coming into collision with another.
- (b.) 156 have consisted of collisions by passenger trains running into trains of another description, such as luggage, coke, mineral, contractors', &c., trains.
- (c.) 51 have been occasioned by other than passenger trains running into passenger trains. And
- (d.) 53 collisions happened by trains, not passenger trains, running into other trains, which were also not passenger trains.

It may be said, that in all the preceding four groups the public, as passengers, were interested, and even the last group, it will be found, records that three passengers were killed and six injured, although the trains were not passenger trains. These deaths and injuries took place amongst persons in charge of horses and cattle.

A very characteristic distinction in the number of collisions, under Groups (b) and (c), is observable. Group (b) shews the number of passenger trains running into others not passenger trains, while Group (c) is the converse kind of collision. Now as passenger trains usually run at a higher speed than the other trains, the greater number of collisions is occasioned by the passenger trains overtaking the others, the difference being almost exactly three times as great.

What is also somewhat curious to observe in the Table under consideration is, the rather close approximation in the number of collisions with each other of trains of a similar kind. The collisions among exclusively passenger trains were, in the nine years, exactly 48; and the collisions in the same period among trains, exclusively other than passenger trains, were 53.

The following shews the ratio of deaths and injuries among passengers in each group of collisions in Table XXIV:—

In Group (a), each collision produced .375 deaths and 6.854 injuries.

|     |      |     |      |     |       |     |
|-----|------|-----|------|-----|-------|-----|
| ... | (b), | ... | .141 | ... | 3.558 | ... |
| ... | (c), | ... | .157 | ... | 5.569 | ... |
| ... | (d), | ... | .057 | ... | 0.113 | ... |

The highest ratio of deaths, and also of injuries, in the above four combinations, will be found in Group (a); and for this there is a very obvious explanation, for the collision in this group consists of one passenger train running into another; consequently, in every such collision, taking one with another, there will be double the number of passengers exposed to risk, which will be found exposed to such risks in collisions under Group (b); and it is rather singular to find, in an inquiry of this kind, so very positive a determination to the development of a law of mortality, when so many disturbing causes might have been considered to influence the results. If the ratio of deaths and injuries in Group (a) be divided by two, the results will be, ratio of deaths .187, and ratio of injuries 3.427, not differing widely from the results of Group (b), nor from the results of Group (c), so far as regards deaths.

Another obvious and important result, arising out of this Table, is the caution indicated in regard to the position of passenger to other trains on the line; for it is the mismanagement of this detail which occasions fully one-half of the whole collisions which take place.



TABLE XXV.

*Shewing the Number of Collisions occurring to each class of Passenger Trains, as compared with those occurring to all Passenger Trains, and to each other; with the Deaths and Injuries occasioned thereby, from 1844 to 1852, inclusive.*

| YEAR.   | a.<br>Express.             |                        |                |          |                  |          | b.<br>Mail.                |                        |                |          |                            |                        | c.<br>Ordinary Passenger Trains. |          |                            |                        |                  |          | d.<br>Excursion.           |                        |                |          |                            |                        | Total.<br>(a + b + c + d.) |          |                            |                        |                  |          |                            |                        |                |          |                  |  |
|---------|----------------------------|------------------------|----------------|----------|------------------|----------|----------------------------|------------------------|----------------|----------|----------------------------|------------------------|----------------------------------|----------|----------------------------|------------------------|------------------|----------|----------------------------|------------------------|----------------|----------|----------------------------|------------------------|----------------------------|----------|----------------------------|------------------------|------------------|----------|----------------------------|------------------------|----------------|----------|------------------|--|
|         | Number of Collisions.      |                        | Em-<br>ployés. |          | Passen-<br>gers. |          | Number of Collisions.      |                        | Em-<br>ployés. |          | Passen-<br>gers.           |                        | Number of Collisions.            |          | Em-<br>ployés.             |                        | Passen-<br>gers. |          | Number of Collisions.      |                        | Em-<br>ployés. |          | Passen-<br>gers.           |                        | Number of Collisions.      |          | Em-<br>ployés.             |                        | Passen-<br>gers. |          | Number of Collisions.      |                        | Em-<br>ployés. |          | Passen-<br>gers. |  |
|         |                            |                        |                |          |                  |          |                            |                        |                |          |                            |                        |                                  |          |                            |                        |                  |          |                            |                        |                |          |                            |                        |                            |          |                            |                        |                  |          |                            |                        |                |          |                  |  |
|         | Not resulting in Injuries. | Resulting in Injuries. | Killed.        | Injured. | Killed.          | Injured. | Not resulting in Injuries. | Resulting in Injuries. | Killed.        | Injured. | Not resulting in Injuries. | Resulting in Injuries. | Killed.                          | Injured. | Not resulting in Injuries. | Resulting in Injuries. | Killed.          | Injured. | Not resulting in Injuries. | Resulting in Injuries. | Killed.        | Injured. | Not resulting in Injuries. | Resulting in Injuries. | Killed.                    | Injured. | Not resulting in Injuries. | Resulting in Injuries. | Killed.          | Injured. | Not resulting in Injuries. | Resulting in Injuries. | Killed.        | Injured. |                  |  |
| 1844    | ..                         | ..                     | ..             | ..       | ..               | ..       | 3                          | ..                     | ..             | ..       | ..                         | ..                     | ..                               | 4        | 57                         | 1                      | 7                | 4        | 57                         | ..                     | 1              | ..       | ..                         | 1                      | 1                          | 6        | 11                         | 1                      | 7                | 5        | 58                         |                        |                |          |                  |  |
| 1845    | ..                         | ..                     | ..             | ..       | ..               | ..       | ..                         | 2                      | ..             | ..       | ..                         | 4                      | 62                               | 2        | 5                          | 4                      | 5                | 4        | 62                         | ..                     | ..             | ..       | ..                         | ..                     | 4                          | 21       | 2                          | 5                      | 4                | 66       |                            |                        |                |          |                  |  |
| 1846    | ..                         | 1                      | ..             | 2        | ..               | ..       | 1                          | 1                      | ..             | ..       | ..                         | 4                      | 73                               | 1        | 15                         | 3                      | 15               | 73       | ..                         | ..                     | ..             | ..       | ..                         | 8                      | 17                         | 7        | 17                         | 1                      | 17               | 3        | 77                         |                        |                |          |                  |  |
| 1847    | 1                          | 1                      | ..             | ..       | ..               | ..       | 3                          | ..                     | ..             | ..       | ..                         | ..                     | 32                               | 2        | 4                          | 9                      | 32               | ..       | ..                         | ..                     | ..             | ..       | 8                          | 10                     | 17                         | 2        | 4                          | 9                      | 41               |          |                            |                        |                |          |                  |  |
| 1848    | 1                          | 2                      | 1              | 4        | 1                | 10       | 1                          | 4                      | 4              | 6        | ..                         | 4                      | 89                               | 1        | 5                          | 6                      | 89               | ..       | ..                         | ..                     | ..             | ..       | ..                         | 8                      | 22                         | 6        | 15                         | 7                      | 103              |          |                            |                        |                |          |                  |  |
| 1849    | ..                         | ..                     | ..             | ..       | ..               | ..       | ..                         | 1                      | ..             | ..       | ..                         | 1                      | 62                               | 1        | 1                          | ..                     | 62               | 1        | 62                         | 1                      | 1              | ..       | 2                          | 8                      | 13                         | 1        | 1                          | ..                     | 65               |          |                            |                        |                |          |                  |  |
| 1850    | ..                         | ..                     | ..             | ..       | ..               | ..       | ..                         | 2                      | ..             | ..       | ..                         | 10                     | 126                              | 8        | 9                          | 6                      | 126              | ..       | ..                         | ..                     | ..             | ..       | ..                         | 5                      | 32                         | 8        | 9                          | 6                      | 136              |          |                            |                        |                |          |                  |  |
| 1851    | ..                         | 1                      | ..             | ..       | ..               | 1        | ..                         | 1                      | ..             | ..       | ..                         | 2                      | 235                              | 5        | 3                          | 9                      | 235              | ..       | ..                         | ..                     | ..             | 63       | 3                          | 33                     | 5                          | 3        | 9                          | 301                    |                  |          |                            |                        |                |          |                  |  |
| 1852    | 1                          | 3                      | 1              | 5        | ..               | 14       | ..                         | 2                      | ..             | 2        | ..                         | 11                     | 296                              | 1        | 8                          | 5                      | 296              | ..       | ..                         | ..                     | ..             | ..       | ..                         | 3                      | 35                         | 2        | 15                         | 5                      | 321              |          |                            |                        |                |          |                  |  |
| Totals. | 3                          | 8                      | 2              | 11       | 1                | 26       | 8                          | 13                     | 4              | 8        | ..                         | 36                     | 1,032                            | 22       | 57                         | 46                     | 1,032            | 1        | 7                          | ..                     | ..             | 1        | 74                         | 54                     | 201                        | 28       | 76                         | 48                     | 1,168            |          |                            |                        |                |          |                  |  |



The next Table, XXV, gives a still further analysis of the passengers, by shewing the number of collisions to each kind of train, whether "express," "mail," "excursion," or ordinary train; and further distinguishes, among the collisions to each of these trains, the number which have resulted in injury to life or limb, and the number of collisions unattended with injury. Other than passenger-trains are excluded.

In this Table, it will be observed, that the collisions of the "express" and "excursion" trains have occasioned but one death each throughout the whole period of nine years, while the collisions of "mail" trains were not attended with a single death to a passenger. So far as collisions are concerned, this ought to satisfy the minds of the timid of the safety of travelling by quick trains.

The following is a condensed Abstract of Table XXV, in respect to passengers only:—

ABSTRACT M.

| Trains.             | Number of               |                     | Number of Passengers. |          | Ratio of Deaths and Injuries to |          |                     |          |
|---------------------|-------------------------|---------------------|-----------------------|----------|---------------------------------|----------|---------------------|----------|
|                     | Non-serious Collisions. | Serious Collisions. | Killed.               | Injured. | All Collisions.                 |          | Serious Collisions. |          |
|                     |                         |                     |                       |          | Killed.                         | Injured. | Killed.             | Injured. |
| Express . . . . .   | 3                       | 8                   | 1                     | 26       | ·091                            | 2·364    | ·125                | 3·250    |
| Excursion . . . . . | 1                       | 7                   | 1                     | 74       | ·125                            | 9·250    | ·143                | 10·571   |
| Mail . . . . .      | 8                       | 13                  | ...                   | 36       | ...                             | 1·714    | ...                 | 2·769    |
| Ordinary . . . . .  | 42                      | 173                 | 46                    | 1,032    | ·214                            | 4·800    | ·266                | 5·965    |
| Total . . . . .     | 54                      | 201                 | 48                    | 1,168    | ·188                            | 4·580    | ·239                | 5·811    |

It will thus be seen, that the ordinary trains have been fatal to life above the average. It will, however, be observed, that although the excursion trains have occasioned fewer deaths than the ordinary trains, yet the ratio of persons injured is nearly double the average. It will, likewise, be observed, that one-fifth part of all the collisions with passenger-trains are unattended with injury.

The following Table, XXVI, which includes collisions by other as well as passenger-trains, is interesting.

One remarkable feature in this Table is, the disparity in the frequency of collisions in different months of the year. It will be seen that, in the six months commencing with August and ending with January, the number of collisions is more than double of the number in the other six months of the year. This is, no doubt, to be in part accounted for by the state of the weather, as may be understood on referring to Section A of Tables XXII and XXIII; but still this would not of itself be sufficient to account for the remarkable difference observable in the preceding Table, unless it be that the "neglect," recorded in Section C of Table XXII and Section E of Table XXIII, be also to some extent occasioned by the trying nature of the weather at the same season. Another curious circumstance is the fact that in the last six months of this Table, in which double the number of collisions have taken place, not quite so many lives of passengers have been



lost, although the passenger traffic of the same six months is greater than in the other six months. For the nine years now under consideration, the passenger traffic of the first six months was 240,307,731, the passenger traffic of the second six months was 302,959,421. And, consequently, the deaths from collisions, during the first six months, were one in every 9,242,605 passengers; and, during the second six months, were one in every 12,118,577 passengers. So that those figures represent the relative chances of loss of life from collisions in railway travelling during the respective seasons, assuming that such accidents should for the future observe the same order of distribution.

TABLE XXVI.

*Shewing the Number of Collisions on the Railways of Great Britain and Ireland for the nine Years 1844—1852, for each Month of the Year, with the Number of Employés and of Passengers Killed and Injured thereby.*

| Month.                    | Number of Collisions. |                                                     |                           | Employés. |          | Passengers. |          |
|---------------------------|-----------------------|-----------------------------------------------------|---------------------------|-----------|----------|-------------|----------|
|                           | Total.                | Not result-<br>ing in injury<br>to Life<br>or Limb. | Resulting<br>in Injuries. | Killed.   | Injured. | Killed.     | Injured. |
| February . . . . .        | 13                    | 4                                                   | 9                         | 2         | 6        | ...         | 15       |
| March . . . . .           | 15                    | 4                                                   | 11                        | 2         | 2        | ...         | 30       |
| April . . . . .           | 10                    | 3                                                   | 7                         | ...       | 4        | 6           | 110      |
| May . . . . .             | 21                    | 4                                                   | 17                        | 4         | ...      | 11          | 75       |
| June . . . . .            | 15                    | ...                                                 | 15                        | 3         | 8        | 7           | 57       |
| July . . . . .            | 25                    | 4                                                   | 21                        | 3         | 17       | 2           | 127      |
| Totals . . . . .          | 99                    | 19                                                  | 80                        | 14        | 37       | 26          | 414      |
| August . . . . .          | 37                    | 7                                                   | 30                        | 3         | 12       | 11          | 200      |
| September . . . . .       | 32                    | 4                                                   | 28                        | 7         | 7        | 3           | 137      |
| October . . . . .         | 35                    | 8                                                   | 27                        | 8         | 18       | 4           | 102      |
| November . . . . .        | 36                    | 8                                                   | 28                        | 5         | 16       | 3           | 177      |
| December . . . . .        | 41                    | 11                                                  | 30                        | 7         | 15       | 4           | 103      |
| January . . . . .         | 28                    | 12                                                  | 16                        | 7         | 10       | ...         | 41       |
| Totals . . . . .          | 209                   | 50                                                  | 159                       | 37        | 78       | 25          | 760      |
| Totals of 12 months . . . | 308                   | 69                                                  | 239                       | 51        | 115      | 51          | 1,174    |

In respect of injuries to passengers, it will be observed, that in frequency they follow almost the precise order of the collisions themselves—the ratio to collisions in the different seasons being nearly the same. The facts in this Table are well worth examination by those intrusted with the management of Railways. It is scarcely possible to conceive that any intelligent superintendent of the trains of a railway, who thoroughly masters the facts in regard to collisions contained in Tables XXII to XXVI inclusive, could not devise some means which would prevent the recurrence of so many accidents of this class.

The only remaining Table now to be brought forward on the subject of collisions is the following one, Table XXVII, in which are shewn the places on the line at which the various collisions have taken place.

[It will be







It will be found that, of a total number of 308 collisions, no less than 110 have taken place at stations, or the very places where the greatest care and vigilance are required and might be exercised. Anything like fair attention to the use of well understood precautions, and a proper use of signals and telegraphs, should completely, or at all events to a great extent, prevent this class of accidents. The same remarks may be justly made in respect to the collisions recorded in Sections *b* and *c* of the same Table. The collisions in the first three sections of this Table constitute about 46 per cent. of the whole number, and are clearly of a kind that may be greatly diminished by a well devised system of management. The accidents from collisions on open lines, or rather at other places than stations, junctions, sidings, and crossings, amount to 165. The intensity of the different kind of collisions in this Table, in death and injury, does not exhibit any very marked disparity.

The only other important class of accidents, from which passengers suffer, and which is assumed to be under the control or management of the companies, are those occasioned by trains, or portions of trains, running off the line.

Of the 228 deaths of passengers from defined causes, given in Table XIII, it will be found that 109 are attributable to causes under control of the companies. And then, again, Table XIII shews that 35, or 32.1 per cent., were occasioned by "running off the line." So far as the management of railways is concerned in preserving the lives of passengers, this class of accidents is second in importance only to that arising from collisions. In fact, "collisions" and "running off the line" caused 91 per cent. of all the deaths of passengers for which the companies can be supposed responsible; and therefore, a thorough analysis of these two classes of accidents will complete the inquiry so far as the lives of passengers are concerned.

In the following Table, XXVIII, will be found the results of the investigation made into the immediate causes of engines, trains, and other parts of trains running off the line. The analysis will be found sufficiently minute and detailed for every useful purpose.

Of 156 cases of "running off the line," the immediate cause has been ascertained in 105 instances. And it is also found, that 105 of the accidents have been attended with injury to life and limb of passengers, and 51 resulted without any injury.

It will immediately appear on examination of Section A of the same Table, as was remarked in regard to the similar section of the Tables of collisions, that it is impossible to hold the companies responsible for every one of this group of accidents. They are so clearly due to causes difficult to be foreseen, that they may for the present be passed over as such.

But in regard to Section B, which includes none but cases of running off the line from the breaking of machinery, there can be no doubt that greater precautions might



*An Analysis of the Causes of Engines, Trains, or Parts of Trains, running off the Rails, on Railways in Great Britain and Ireland; from the Year 1844 to the Year 1852, inclusive.*

[illegible]



generally be taken. The remarks offered on the "breaking of machinery," as the immediate cause of collisions, apply with equal force in this instance, and need not again be repeated; but it is certainly to be lamented that, of the 105 ascertained cases of "running off the line," no less than 43 should be due to the "breaking of machinery." Frequent inspection by competent parties is the protection against this group of accidents: and strong measures should be enforced to secure the safety arising from this sort of supervision.

The accidents arising from the causes recorded in Section C are certainly, at least to a very great extent, preventable. Nothing but the most culpable indifference to the public safety can permit a continuance of this group of accidents, which forms upwards of 28 per cent. of all the classified accidents in the Table.

The accidents included in Columns 2 and 3 of Section D, cannot in general be attributable to negligence of the companies.

The four cases in Section E are due to reckless driving.

Sections B and C of this Table should be well considered by railway directors.

The next, Table XXIX, will shew how the various groups of accidents of "running off the line" affected life and limb of passengers.

What is strange in the record of accidents contained in this Table is, that the 51 cases, included in Sections A and B, did not occasion a single death of a passenger, while the 30 in Section C, attributable to defects in the "permanent way," produced eight deaths of passengers.

The number of deaths of passengers from obstructions on the line was three, but no passenger lost his life under Section E, through reckless driving, or excessive speed.

The miscellaneous group, Section F, it will be seen, includes 55, or upwards of one-third of all the cases of trains running off the rails, to which unascertained causes nearly one-half of the whole deaths of passengers from running off the line is due. But the returns of the railway department were either defective as to these cases, or the accidents themselves were of so peculiar a kind as not to admit of a satisfactory classification.

When that part of the subject, which has reference to the manner in which railway accidents have affected the employés, is considered, the effects of trains running off the line will be more fully discussed. From Tables XXIV and XXVI, preceding, it will be observed that collisions killed an equal number of employés and passengers; but the cases of running off the line have relatively, as will be seen by the last columns of Table XXIX, a much more fatal effect on the servants of the companies.



TABLE XXIX.

Reviewing the Number of Deaths and Injuries, to Railway Employés and to Passengers, due to each Cause of Trains, or Parts of Trains, or Engines running off the Rails of Railways in Great Britain and Ireland, from 1844 to 1852.

| A.       |  |       |  |                   |  |         |  |             |  | B. Machinery Breaking. |  |                              |  |                   |  |            |  |          |  | C. Defects in Permanent Way.    |  |       |  |                               |  |         |  |            |  | D. Obstructions on Line. |  |                         |  |                   |  |                         |  |          |  | E. Reckless Driving, or Excessive Speed. |  |       |  | F. Miscellaneous, and not ascertained. |  |         |  | Grand Total. |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |        |  |
|----------|--|-------|--|-------------------|--|---------|--|-------------|--|------------------------|--|------------------------------|--|-------------------|--|------------|--|----------|--|---------------------------------|--|-------|--|-------------------------------|--|---------|--|------------|--|--------------------------|--|-------------------------|--|-------------------|--|-------------------------|--|----------|--|------------------------------------------|--|-------|--|----------------------------------------|--|---------|--|--------------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|-------------------|--|---------|--|----------|--|------|--|-------|--|--------|--|
| Weather. |  |       |  | a. Engines.       |  |         |  | b. Tenders. |  |                        |  | c. Carriages, or Trucks, &c. |  |                   |  | d. Totals. |  |          |  | a. Rails, Points, and Switches. |  |       |  | b. Bad Road, or under Repair. |  |         |  | c. Totals. |  |                          |  | a. On or between Rails. |  |                   |  | b. Contact with Cattle. |  |          |  | c. Totals.                               |  |       |  |                                        |  |         |  |              |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |                   |  |         |  |          |  |      |  |       |  |        |  |
| Emp.     |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured.    |  | Emp.                   |  | Pass.                        |  | No. of Accidents. |  | Killed.    |  | Injured. |  | Emp.                            |  | Pass. |  | No. of Accidents.             |  | Killed. |  | Injured.   |  | Emp.                     |  | Pass.                   |  | No. of Accidents. |  | Killed.                 |  | Injured. |  | Emp.                                     |  | Pass. |  | No. of Accidents.                      |  | Killed. |  | Injured.     |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of Accidents. |  | Killed. |  | Injured. |  | Emp. |  | Pass. |  | No. of |  |



TABLE XXX.

*Shewing the number of Accidents, by Trains running off the Line, unattended and attended with Injury, in each year, from 1844 to 1852, inclusive, occurring to each species of Train, with the Number of Employés and Passengers Killed and Injured thereby.*

| YEAR.  | Express.                 |                      |         |          | Mail.   |          |         |          | All other Passenger Trains. |          |                          |                      | Engines.                 |                      |         |          | Goods, &c., Trains. |          |                          |                      | Trains not specified.    |                      |         |          | Totals.                  |                      |         |          |
|--------|--------------------------|----------------------|---------|----------|---------|----------|---------|----------|-----------------------------|----------|--------------------------|----------------------|--------------------------|----------------------|---------|----------|---------------------|----------|--------------------------|----------------------|--------------------------|----------------------|---------|----------|--------------------------|----------------------|---------|----------|
|        | Number of Accidents.     |                      | Emp.    |          | Pass.   |          | Emp.    |          | Pass.                       |          | Emp.                     |                      | Number of Accidents.     |                      | Emp.    |          | Pass.               |          | Emp.                     |                      | Number of Accidents.     |                      | Emp.    |          | Number of Accidents.     |                      | Emp.    |          |
|        |                          |                      |         |          |         |          |         |          |                             |          |                          |                      |                          |                      |         |          |                     |          |                          |                      |                          |                      |         |          |                          |                      |         |          |
|        | Not resulting in Injury. | Resulting in Injury. | Killed. | Injured. | Killed. | Injured. | Killed. | Injured. | Killed.                     | Injured. | Not resulting in Injury. | Resulting in Injury. | Not resulting in Injury. | Resulting in Injury. | Killed. | Injured. | Killed.             | Injured. | Not resulting in Injury. | Resulting in Injury. | Not resulting in Injury. | Resulting in Injury. | Killed. | Injured. | Not resulting in Injury. | Resulting in Injury. | Killed. | Injured. |
| 1844   | ..                       | ..                   | ..      | ..       | ..      | ..       | ..      | 3        | ..                          | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| 1845   | ..                       | 2                    | ..      | 3        | ..      | 9        | ..      | ..       | ..                          | ..       | ..                       | ..                   | 1                        | ..                   | ..      | ..       | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| 1846   | ..                       | 2                    | 1       | 1        | ..      | ..       | ..      | 17       | ..                          | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| 1847   | 1                        | 3                    | 1       | 2        | 1       | ..       | ..      | 17       | ..                          | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| 1848   | 1                        | 3                    | ..      | 2        | 2       | 1        | 1       | 11       | ..                          | ..       | ..                       | ..                   | 2                        | 1                    | 1       | 1        | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| 1849   | ..                       | 1                    | 2       | ..       | ..      | ..       | ..      | 17       | ..                          | ..       | ..                       | ..                   | 1                        | 1                    | 1       | ..       | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| 1850   | ..                       | 1                    | ..      | ..       | 1       | ..       | ..      | 17       | ..                          | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| 1851   | ..                       | ..                   | ..      | ..       | ..      | ..       | ..      | 48       | ..                          | ..       | ..                       | ..                   | 1                        | 1                    | 1       | 1        | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| 1852   | ..                       | 4                    | 4       | 2        | ..      | 3        | ..      | 14       | ..                          | ..       | ..                       | ..                   | 1                        | 1                    | ..      | 1        | ..                  | ..       | ..                       | ..                   | ..                       | ..                   | ..      | ..       | ..                       | ..                   | ..      | ..       |
| Totals | 2                        | 16                   | 8       | 10       | 4       | 15       | ..      | 1        | ..                          | ..       | ..                       | ..                   | 4                        | 5                    | 2       | 5        | ..                  | ..       | ..                       | ..                   | 4                        | 6                    | 4       | 7        | ..                       | ..                   | ..      | ..       |



In the preceding Table, XXX, will be seen in what manner the different kind of trains were affected by the class of accidents now under consideration.

It was found in Table XXV that the passengers by "express" trains suffered less from the collisions which occurred, than the passengers by other trains. But in regard to the class of accidents in the preceding Table, the case is very different; for, from the 18 cases of "running off the line" by express trains, 4 deaths of passengers happened, while from the 93 cases taking place among "mail" and other passenger trains, the number of deaths was 17. In regard, however, to injuries only, the ratio was also less in the case of "express" trains.

The preceding portion of this paper has been confined chiefly to an examination of the manner in which railway accidents have affected passengers, although the Tables themselves contain the results of the analysis for employés and other persons not passengers for the time being: it now remains to investigate the manner in which railway accidents have affected railway servants, and other persons not passengers.

Although the general public is naturally most alive to the manner in which passengers suffer from accidents, still every earnest inquirer must at once sympathize with the dreadful amount of accidents and fearful loss of life to which the servants of railway companies are exposed. It is quite impossible not to regard this latter branch of the inquiry as really the more grave and important of the two. Table XII shews that while in the twelve years ending 1852 the loss of life amongst passengers was 266, 1081 deaths took place amongst the employés. This statement is of itself sufficient to prevent the remaining portion of this paper from being regarded with indifference.

Some difficulty was experienced in the treatment of the succeeding part of this inquiry, owing to the obscurity which obtained as to the precise number of persons employed in different departments of the railway service during the earlier years to which the investigation relates. Since 1848, however, several parliamentary returns afford the means of making a near approximation to the number of persons employed in the different departments, and hence offer a ready means by which to determine the numbers constantly exposed to the risk of accidents.

From the data in the following Table, XXXI, these numbers are easily deduced.

The returns which furnish the data for the last two columns of this Table were issued subsequently to the preparation of the principal part of this paper; but it will be found that the principle on which the Table has been constructed produces results almost identical for practical purposes with those given in the parliamentary returns themselves.

Table XXXII exhibits the number of employés of different descriptions exposed continuously to the risk of accidents. The principle on which it has been constructed from the data contained in Table XXXI is obvious.

[By the aid



TABLE XXXI.

*Number and Description of Persons Employed on all Railways open for Traffic in Great Britain and Ireland.*

| Class of Persons.                            | On<br>1st May,<br>1848. | On<br>30th June,<br>1848. | On<br>30th June,<br>1849. | On<br>30th June,<br>1850. | On<br>30th June,<br>1851. | On<br>31st Dec.,<br>1851. | Total from<br>30th June, 1848,<br>to<br>31st Dec., 1851. | On<br>30th June,<br>1852. | On<br>30th June,<br>1853. |
|----------------------------------------------|-------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------------------------------------|---------------------------|---------------------------|
| Superior Officers ( <i>g</i> ) . . . . .     | 6,298                   | 6,468*                    | 7,490                     | 8,298†                    | 9,106                     | 9,510‡                    | 28,330§                                                  | 8,702                     | 9,949                     |
| Engine-men, or Drivers . . . . .             | 1,752                   | 1,764                     | 1,839                     | 2,049                     | 2,258                     | 2,363                     | 7,080                                                    | 2,397                     | 2,821                     |
| Assistant Engine-men, or Stokers . . . . .   | 1,809                   | 1,818                     | 1,871                     | 2,129                     | 2,387                     | 2,516                     | 7,360                                                    | 2,460                     | 2,869                     |
| Conductors, or Guards . . . . .              | 1,496                   | 1,515                     | 1,631                     | 1,941                     | 2,252                     | 2,407                     | 6,660                                                    | 2,257                     | 2,641                     |
| Artificers ( <i>a</i> ) . . . . .            | 10,814                  | 10,813                    | 10,809                    | 11,636                    | 12,463                    | 12,876                    | 40,521                                                   | 13,878                    | 15,624                    |
| Switchmen ( <i>b</i> ) . . . . .             | 1,058                   | 1,127                     | 1,540                     | 1,703                     | 1,865                     | 1,946                     | 5,711                                                    | 1,605                     | 2,223                     |
| Policemen ( <i>c</i> ) . . . . .             | 2,475                   | 2,337                     | 1,508                     | 1,553                     | 1,599                     | 1,622                     | 5,841                                                    | 1,567                     | 1,542                     |
| Porters and Messengers . . . . .             | 7,559                   | 7,656                     | 8,238                     | 9,007                     | 9,776                     | 10,160                    | 31,041                                                   | 10,434                    | 12,188                    |
| Plate-layers ( <i>d</i> ) . . . . .          | 4,391                   | 4,551                     | 5,508                     | 5,557                     | 5,605                     | 5,629                     | 18,957                                                   | 4,909                     | 6,033                     |
| Labourers ( <i>e</i> ) . . . . .             | 14,438                  | 14,380                    | 14,029                    | 14,419                    | 14,810                    | 15,005                    | 50,551                                                   | 13,682                    | 18,987                    |
| Miscellaneous ( <i>f</i> ) . . . . .         | 598                     | 728                       | 1,505                     | 1,474                     | 1,442                     | 1,426                     | 4,777                                                    | 2,626                     | 2,069                     |
| <i>a + b + c + d + e + f + g</i> and others. | 40,072                  | 40,403                    | 42,389                    | 44,639                    | 46,890                    | 48,015                    | 154,682                                                  | 50,053                    | 59,890                    |

The figures of the 3rd, 5th, and 7th columns are thus derived, viz. :—

$$* \text{ As 14 months } \left( \begin{array}{c} \text{1st May, 1848,} \\ \text{to} \\ \text{30th June, 1849,} \end{array} \right) : 1,192 = \left\{ \begin{array}{c} (7,490 - 6,298) \\ \text{or} \\ \text{increase in} \\ \text{that time} \end{array} \right\} : : 2 \text{ months } \left( \begin{array}{c} \text{1st May, 1848,} \\ \text{to} \\ \text{30th June, 1848,} \end{array} \right) : \text{increase in that time} = 170. \text{ Then}$$

$$6,298 + 170 = 6,468.$$

$$† \text{ As 24 months } \left( \begin{array}{c} \text{30th June, 1849,} \\ \text{to} \\ \text{30th June, 1851,} \end{array} \right) : 1,616 = (\text{increase}) : : 6 \text{ months } \left( \begin{array}{c} \text{30th June, 1851,} \\ \text{to} \\ \text{31st Dec., 1851,} \end{array} \right) : \text{increase} = 404. \text{ Then } 9,106 + 404 = 9,510.$$

$$‡ \text{ As 24 months } \left( \begin{array}{c} \text{30th June, 1849,} \\ \text{to} \\ \text{30th June, 1851,} \end{array} \right) : 1,616 = (\text{increase}) : : 6 \text{ months } \left( \begin{array}{c} \text{30th June, 1851,} \\ \text{to} \\ \text{31st Dec., 1851,} \end{array} \right) : \text{increase} = 404. \text{ Then } 9,106 + 404 = 9,510.$$

§ See Table XXXII. (Note †).



TABLE XXXII.

*Number and Description of Railway Company's Servants exposed to Risk from 30th June, 1848, to 31st December, 1851.*

| YEARS.                                       | (g)<br>Superior<br>Officers. | Engine<br>Drivers. | Stokers. | Guards. | (a)<br>Artificers. | (b)<br>Switch-<br>men. | (c)<br>Police-<br>men. | Porters. | (d)<br>Plate-<br>layers. | (e)<br>Labourers. | (f)<br>Miscel-<br>laneous. | $a+b+c+d+e+f+g$<br>"Other Servants." | Totals.  |
|----------------------------------------------|------------------------------|--------------------|----------|---------|--------------------|------------------------|------------------------|----------|--------------------------|-------------------|----------------------------|--------------------------------------|----------|
| 30th June, 1848, to<br>30th June, 1849       | 6,979+                       | 1,801½             | 1,844½   | 1,573   | 10,811             | 1,333½                 | 1,922½                 | 7,947    | 5,029½                   | 14,209½           | 1,116½                     | 41,396                               | 95,963½  |
| 30th June, 1849, to<br>30th June, 1850       | 7,894                        | 1,943¾             | 2,000    | 1,786½  | 11,222½            | 1,621½                 | 1,530¾                 | 8,622½   | 5,532½                   | 14,224½           | 1,489¾                     | 43,514½                              | 101,381½ |
| 30th June, 1850, to<br>30th June, 1851       | 8,702                        | 2,153½             | 2,258    | 2,096¾  | 12,049½            | 1,783¾                 | 1,576½                 | 9,391½   | 5,580¾                   | 14,614¾           | 1,457¾                     | 45,764¾                              | 107,429  |
| 30th June, 1851, to<br>31st Dec., 1851       | 4,755                        | 1,181½             | 1,258    | 1,203½  | 6,438              | 973                    | 811                    | 5,080    | 2,814½                   | 7,502½            | 713                        | 24,007½                              | 56,737½  |
| (Col. 8, Table XXXI.)<br>Totals—3½ years ... | 28,330+                      | 7,080              | 7,360½   | 6,659½  | 40,521             | 5,711½                 | 5,840½                 | 31,041   | 18,957                   | 50,551            | 4,777                      | 154,682½                             | 361,511½ |

The numbers in this Table are thus obtained (see Table XXXI):—

$$+ \text{Average number from 30th June, 1848, to 30th June, 1849,} = \frac{6,468 + 7,490}{2} = 6,979$$

$$\dots \dots \dots 1849, \dots \dots 1850, = \frac{7,490 + 8,298}{2} = 7,894$$

$$\dots \dots \dots 1850, \dots \dots 1851, = \frac{8,298 + 9,106}{2} = 8,702$$

$$\dots \dots \dots 30\text{th June, to 31st December, 1851,} = \frac{9,106 + 9,914^*}{4} = 4,755$$

$$\text{Total } 28,330$$

\* 9,914, number employed at end of year (from 30th June).

For, increase in half-year =  $(9,510 - 9,106) = 404$ ,

∴ ... whole year = 808.



TABLE XXXIII.

Number and Description of Employés exposed to Risk in the undermentioned Years.

| DATE.                 | 1.<br>Superior<br>Officers.<br>(g) | 2.<br>Engine<br>Men. | 3.<br>Stokers. | 4.<br>Guards. | 5.<br>Artificers.<br>(a) | 6.<br>Switchmen.<br>(b) | 7.<br>Policemen.<br>(c) | 8.<br>Porters. | 9.<br>Plate-layers.<br>(d) | 10.<br>Labourers.<br>(e) | 11.<br>Miscel-<br>laneous.<br>(f) | 12.<br>$a+b+c+d+e+f+g$ . |
|-----------------------|------------------------------------|----------------------|----------------|---------------|--------------------------|-------------------------|-------------------------|----------------|----------------------------|--------------------------|-----------------------------------|--------------------------|
| Last 5 months of 1840 | 824                                | 208                  | 216            | 193           | 1,201                    | 164                     | 184                     | 911            | 558                        | 1,515                    | 135                               | 4,581                    |
| Year 1841 . . .       | 2,243                              | 566                  | 587            | 525           | 3,270                    | 446                     | 501                     | 2,480          | 1,518                      | 4,122                    | 368                               | 12,468                   |
| ... 1842 . . .        | 2,449                              | 618                  | 641            | 573           | 3,570                    | 487                     | 547                     | 2,708          | 1,657                      | 4,501                    | 402                               | 13,613                   |
| ... 1843 . . .        | 2,588                              | 659                  | 683            | 611           | 3,805                    | 519                     | 583                     | 2,886          | 1,766                      | 4,797                    | 429                               | 14,487                   |
| Total . . .           | 8,104                              | 2,051                | 2,127          | 1,902         | 11,846                   | 1,616                   | 1,815                   | 8,985          | 5,499                      | 14,935                   | 1,334                             | 45,149                   |
| Year 1844 . . .       | 2,787                              | 709                  | 735            | 658           | 4,096                    | 559                     | 627                     | 3,107          | 1,901                      | 5,163                    | 461                               | 15,593                   |
| ... 1845 . . .        | 3,211                              | 809                  | 845            | 751           | 4,681                    | 638                     | 716                     | 3,550          | 2,173                      | 5,901                    | 527                               | 17,847                   |
| ... 1846 . . .        | 3,677                              | 928                  | 962            | 860           | 5,273                    | 731                     | 820                     | 4,065          | 2,488                      | 6,757                    | 604                               | 20,350                   |
| ... 1847 . . .        | 4,807                              | 1,212                | 1,258          | 1,125         | 7,008                    | 956                     | 1,073                   | 5,315          | 3,253                      | 8,835                    | 789                               | 26,721                   |
| Total . . .           | 14,482                             | 3,658                | 3,800          | 3,394         | 21,058                   | 2,884                   | 3,236                   | 16,037         | 9,815                      | 26,656                   | 2,381                             | 80,511                   |
| Year 1848 . . .       | 6,468                              | 1,764                | 1,818          | 1,515         | 10,813                   | 1,127                   | 2,337                   | 7,656          | 4,551                      | 14,380                   | 728                               | 40,404                   |
| ... 1849 . . .        | 7,490                              | 1,839                | 1,871          | 1,631         | 10,809                   | 1,540                   | 1,508                   | 8,238          | 5,508                      | 14,029                   | 1,505                             | 42,389                   |
| ... 1850 . . .        | 8,298                              | 2,049                | 2,129          | 1,941         | 11,636                   | 1,703                   | 1,553                   | 9,007          | 5,557                      | 14,419                   | 1,474                             | 44,640                   |
| ... 1851 . . .        | 9,106                              | 2,258                | 2,387          | 2,252         | 12,463                   | 1,865                   | 1,599                   | 9,776          | 5,605                      | 14,810                   | 1,442                             | 46,890                   |
| Total . . .           | 31,362                             | 7,910                | 8,205          | 7,339         | 45,721                   | 6,235                   | 6,997                   | 34,677         | 21,221                     | 57,638                   | 5,149                             | 174,323                  |
| Total of 3 periods    | 53,948                             | 13,619               | 14,132         | 12,635        | 78,625                   | 10,735                  | 12,048                  | 59,699         | 36,535                     | 99,229                   | 8,864                             | 299,983                  |
| Year 1852 . . .       | 9,609                              | 2,446                | 2,537          | 2,269         | 14,136                   | 1,928                   | 2,163                   | 10,722         | 6,561                      | 17,827                   | 1,592                             | 53,897                   |
| Grand Total           | 63,557                             | 16,065               | 16,669         | 14,904        | 92,761                   | 12,663                  | 14,211                  | 70,421         | 43,096                     | 117,056                  | 10,456                            | 353,880                  |



TABLE XXXIV.

*Shewing the Per-Centage of Deaths and Injuries amongst each class of Railway Employés during the last Five Months of 1840, and during each Year down to 1853.*

| YEAR.        | Engine Drivers. |         |          |                        |                          | Stokers.        |         |          |                        |                          | Guards.         |         |          |                        |                          | Porters.        |         |          |                        |                          | Other Servants. |         |          |                        |                          |
|--------------|-----------------|---------|----------|------------------------|--------------------------|-----------------|---------|----------|------------------------|--------------------------|-----------------|---------|----------|------------------------|--------------------------|-----------------|---------|----------|------------------------|--------------------------|-----------------|---------|----------|------------------------|--------------------------|
|              | Number Exposed. | Killed. | Injured. | Per-Centage of Deaths. | Per-Centage of Injuries. | Number Exposed. | Killed. | Injured. | Per-Centage of Deaths. | Per-Centage of Injuries. | Number Exposed. | Killed. | Injured. | Per-Centage of Deaths. | Per-Centage of Injuries. | Number Exposed. | Killed. | Injured. | Per-Centage of Deaths. | Per-Centage of Injuries. | Number Exposed. | Killed. | Injured. | Per-Centage of Deaths. | Per-Centage of Injuries. |
| 1840         | 208             | 1       | 6        | .481                   | .2885                    | 216             | 1       | 5        | .463                   | .2315                    | 193             | ..      | 2        | 1.036                  | .911                     | 911             | 1       | ..       | .110                   | ..                       | 4,581           | 12      | 8        | .262                   | .175                     |
| 1841         | 566             | 1       | 4        | .177                   | .707                     | 587             | ..      | 4        | ..                     | .682                     | 525             | 4       | 5        | .190                   | .161                     | 2,480           | 4       | 3        | .161                   | .121                     | 12,468          | 23      | 18       | .184                   | .144                     |
| 1842         | 618             | 2       | 4        | .324                   | .647                     | 641             | 4       | 5        | .624                   | .780                     | 573             | 7       | 2        | 1.222                  | .111                     | 2,708           | 3       | 2        | .111                   | .074                     | 13,613          | 27      | 22       | .198                   | .162                     |
| 1843         | 659             | 3       | 4        | .455                   | .607                     | 683             | 2       | 5        | .293                   | .732                     | 611             | 5       | 2        | .818                   | .277                     | 2,886           | 8       | 4        | .277                   | .139                     | 14,487          | 21      | 13       | .145                   | .090                     |
|              | 2,051           | 7       | 18       | .341                   | .878                     | 2,127           | 7       | 19       | .329                   | .893                     | 1,902           | 13      | 11       | .683                   | .178                     | 8,985           | 16      | 9        | .178                   | .100                     | 45,149          | 83      | 61       | .184                   | .135                     |
| 1844         | 709             | 7       | 6        | .989                   | .846                     | 735             | 6       | 12       | .816                   | 1.633                    | 658             | 5       | 6        | .760                   | .193                     | 3,107           | 6       | 4        | .193                   | .129                     | 15,593          | 28      | 17       | .180                   | .109                     |
| 1845         | 809             | 3       | 5        | .371                   | .618                     | 845             | 7       | 8        | .828                   | .947                     | 751             | 6       | 7        | .799                   | .169                     | 3,550           | 6       | 2        | .169                   | .056                     | 17,847          | 36      | 23       | .202                   | .129                     |
| 1846         | 928             | 7       | 14       | .754                   | 1.509                    | 962             | 7       | 11       | .163                   | 1.144                    | 860             | 9       | 9        | 1.046                  | .172                     | 4,065           | 7       | 7        | .172                   | .056                     | 20,350          | 61      | 35       | .300                   | .172                     |
| 1847         | 1,212           | 11      | 6        | .916                   | .495                     | 1,258           | 22      | 17       | 1.749                  | 1.351                    | 1,125           | 10      | 9        | .889                   | .075                     | 5,315           | 12      | 4        | .226                   | .075                     | 26,721          | 67      | 31       | .251                   | .116                     |
|              | 3,658           | 28      | 31       | .765                   | .847                     | 3,800           | 42      | 48       | 1.105                  | 1.263                    | 3,394           | 30      | 31       | .884                   | .193                     | 16,037          | 31      | 17       | .193                   | .106                     | 80,511          | 192     | 106      | .238                   | .131                     |
| 1848         | 1,764           | 6       | 11       | .340                   | .624                     | 1,818           | 14      | 14       | .770                   | .770                     | 1,515           | 22      | 10       | 1.452                  | .660                     | 7,656           | 10      | 6        | .131                   | .078                     | 40,404          | 86      | 33       | .213                   | .082                     |
| 1849         | 1,839           | 6       | 8        | .326                   | .435                     | 1,871           | 13      | 7        | .695                   | .374                     | 1,631           | 15      | 14       | .920                   | .858                     | 8,238           | 13      | 8        | .158                   | .097                     | 42,389          | 82      | 41       | .193                   | .097                     |
| 1850         | 2,049           | 4       | 11       | .195                   | .536                     | 2,129           | 16      | 8        | .752                   | .376                     | 1,941           | 21      | 15       | 1.082                  | .773                     | 9,007           | 9       | 5        | .100                   | .056                     | 44,640          | 79      | 22       | .177                   | .049                     |
| 1851         | 2,258           | 11      | 5        | .487                   | .221                     | 2,387           | 6       | 10       | .251                   | .418                     | 2,252           | 14      | 3        | .622                   | .133                     | 9,776           | 19      | 11       | .194                   | .113                     | 46,890          | 63      | 21       | .134                   | .045                     |
|              | 7,910           | 27      | 35       | .341                   | .442                     | 8,205           | 49      | 39       | .597                   | .475                     | 7,339           | 72      | 42       | .981                   | .572                     | 34,677          | 51      | 30       | .147                   | .086                     | 174,323         | 310     | 117      | .178                   | .067                     |
| 1852         | 2,446           | 11      | 10       | .449                   | .409                     | 2,537           | 18      | 17       | .709                   | .670                     | 2,269           | 12      | 16       | .529                   | .705                     | 10,722          | 19      | 9        | .177                   | .084                     | 53,897          | 63      | 37       | .117                   | .069                     |
| 1840 to 1851 | 13,619          | 62      | 84       | .455                   | .617                     | 14,132          | 98      | 106      | .693                   | .705                     | 12,635          | 115     | 84       | .910                   | .665                     | 59,699          | 98      | 56       | .164                   | .094                     | 299,983         | 585     | 284      | .195                   | .095                     |
| 1840 to 1852 | 16,065          | 73      | 94       | .454                   | .585                     | 16,669          | 116     | 123      | .695                   | .738                     | 14,904          | 127     | 100      | .852                   | .671                     | 70,421          | 117     | 65       | .166                   | .092                     | 353,880         | 648     | 321      | .183                   | .091                     |



TABLE XXXV.

*Number and Ratio of Deaths and Injuries from all Causes among Employés.*

| Period.                           | Engine Drivers. |         |          | Ratios.       |                |
|-----------------------------------|-----------------|---------|----------|---------------|----------------|
|                                   | Number.         | Killed. | Injured. | One Killed in | One Injured in |
| 7th August 1840 to 1843 . . . . . | 2,051           | 7       | 18       | 293           | 114            |
| ... 1844 ... 1847 . . . . .       | 3,658           | 28      | 31       | 131           | 118            |
| ... 1848 ... 1851 . . . . .       | 7,910           | 27      | 35       | 293           | 226            |
| ... 1840 ... 1851 . . . . .       | 13,619          | 62      | 84       | 220           | 162            |
| ... 1852 . . . . .                | 2,446           | 11      | 10       | 222           | 245            |
| Grand Total . . . . .             | 16,065          | 73      | 94       | 220           | 171            |
| Period.                           | Stokers.        |         |          | Ratios.       |                |
|                                   | Number.         | Killed. | Injured. | One Killed in | One Injured in |
| 7th August 1840 to 1843 . . . . . | 2,127           | 7       | 19       | 304           | 112            |
| ... 1844 ... 1848 . . . . .       | 3,800           | 42      | 48       | 90            | 79             |
| ... 1848 ... 1851 . . . . .       | 8,205           | 49      | 39       | 168           | 210            |
| ... 1840 ... 1851 . . . . .       | 14,132          | 98      | 106      | 144           | 133            |
| ... 1852 . . . . .                | 2,537           | 18      | 17       | 141           | 149            |
| Grand Total . . . . .             | 16,669          | 116     | 123      | 144           | 136            |
| Period.                           | Guards.         |         |          | Ratios.       |                |
|                                   | Number.         | Killed. | Injured. | One Killed in | One Injured in |
| 7th August 1840 to 1843 . . . . . | 1,902           | 13      | 11       | 146           | 173            |
| ... 1844 ... 1847 . . . . .       | 3,394           | 30      | 31       | 113           | 109            |
| ... 1848 ... 1851 . . . . .       | 7,339           | 72      | 42       | 102           | 175            |
| ... 1840 ... 1851 . . . . .       | 12,635          | 115     | 84       | 110           | 150            |
| ... 1852 . . . . .                | 2,269           | 12      | 16       | 189           | 142            |
| Grand Total . . . . .             | 14,904          | 127     | 100      | 117           | 149            |
| Period.                           | Porters.        |         |          | Ratios.       |                |
|                                   | Number.         | Killed. | Injured. | One Killed in | One Injured in |
| 7th August 1840 to 1843 . . . . . | 8,985           | 16      | 9        | 562           | 998            |
| ... 1844 ... 1847 . . . . .       | 16,037          | 31      | 17       | 517           | 943            |
| ... 1848 ... 1851 . . . . .       | 34,677          | 51      | 30       | 680           | 1,156          |
| ... 1840 ... 1851 . . . . .       | 59,699          | 98      | 56       | 609           | 1,066          |
| ... 1852 . . . . .                | 10,722          | 19      | 9        | 564           | 1,191          |
| Grand Total . . . . .             | 70,421          | 117     | 65       | 602           | 1,083          |
| Period.                           | Other Servants. |         |          | Ratios.       |                |
|                                   | Number.         | Killed. | Injured. | One Killed in | One Injured in |
| 7th August 1840 to 1843 . . . . . | 45,149          | 83      | 61       | 544           | 740            |
| ... 1844 ... 1847 . . . . .       | 80,511          | 192     | 106      | 419           | 760            |
| ... 1848 ... 1851 . . . . .       | 174,323         | 310     | 117      | 562           | 1,490          |
| ... 1840 to 1851 . . . . .        | 299,983         | 585     | 284      | 513           | 1,056          |
| ... 1852 . . . . .                | 53,897          | 63      | 37       | 856           | 1,457          |
| Grand Total . . . . .             | 353,880         | 648     | 321      | 546           | 1,102          |



By the aid of Tables XXXI and XXXII, Table XXXIII has been calculated, so as to shew for precisely the same periods of time to which the data given in the early part of this paper relate, the number of employés exposed to risk; thus placing the different elements entering into the inquiry in a fitting shape to determine the relation of the one to the other. The mode by which these figures have been obtained from Tables XXXI and XXXII, will be at once understood on a careful perusal. Table XXXIII will be found exceedingly useful for future reference by those giving attention to the economics of our railway system generally, as well as to those who may direct their attention to the special object of this inquiry.

Table XXXIV completes the principal series of elementary facts which enter into the present part of this investigation. The details as to deaths and injuries will be found in Table XII, page 246 *ante*; and those in regard to the numbers exposed to the risks of accident will be found, as already stated, in Tables XXXI, XXXII, and XXXIII, preceding.

It will frequently be necessary to refer to the facts set forth in Table XXXIV; but, for the immediate purpose of determining the ratio of deaths and injuries from all causes or kinds of railway accidents amongst employés, compared with the ratio found to prevail amongst passengers, Table XXXV will be convenient; from which it will be seen that the ratio of deaths per annum amongst different classes of employés for the whole period of years, now under consideration, has been as follows, viz.:—

|                                     |     |                |            |
|-------------------------------------|-----|----------------|------------|
| The ratio of deaths per annum among |     | Engine-Drivers | = 1 in 220 |
| ...                                 | ... | Stokers        | = ... 144  |
| ...                                 | ... | Guards         | = ... 117  |
| ...                                 | ... | Porters        | = ... 602  |
| ...                                 | ... | Other Servants | = ... 546  |

It is thus evident that, for the whole period from 1840-52, the ratio of deaths has been, amongst the first three classes of servants, least in the group engine-drivers, and highest in that of guards. A similar result appeared also in Table XXXIV. This relation, however, of the mortality from accidents has not been uniformly maintained by the same three classes throughout the whole of the period under observation, as will be seen by a comparison of the mortality of stokers with that of guards for the period 1844-48. The mortality of the fourth and fifth groups of employés differs widely from that of the other three groups; and the same remark is applicable to the ratio of injuries in the same groups.

|                                   |     |                |             |
|-----------------------------------|-----|----------------|-------------|
| The ratio of injuries being among |     | Engine-Drivers | = 1 in 171  |
| ...                               | ... | Stokers        | = ... 136   |
| ...                               | ... | Guards         | = ... 149   |
| ...                               | ... | Porters        | = ... 1,083 |
| ...                               | ... | Other Servants | = ... 1,102 |

In respect to deaths, the ratio for stokers was intermediate between that for engine-drivers and guards; but so far as injuries are concerned, the ratio for stokers is higher than that for either guards or engine-drivers.

It will assist the object of this inquiry to consider the facts of the preceding Table, as given in the following condensed summary:—



## ABSTRACT N.

| Period.                 | Engine Drivers, Stokers, and Guards. |         |          | Ratios.       |                |
|-------------------------|--------------------------------------|---------|----------|---------------|----------------|
|                         | Number.                              | Killed. | Injured. | One Killed in | One Injured in |
| 1840 to 1843 . . . . .  | 6,080                                | 27      | 48       | 229           | 129            |
| 1844 ... 1847 . . . . . | 10,852                               | 100     | 110      | 109           | 99             |
| 1848 ... 1851 . . . . . | 23,454                               | 148     | 116      | 158           | 200            |
| 1840 to 1851 . . . . .  | 40,386                               | 275     | 274      | 147           | 148            |
| 1852 . . . . .          | 7,252                                | 41      | 43       | 177           | 169            |
| Grand Total . . . . .   | 47,638                               | 316     | 317      | 151           | 150            |

| Period.                 | Porters and Other Servants. |         |          | Ratios.       |                |
|-------------------------|-----------------------------|---------|----------|---------------|----------------|
|                         | Number.                     | Killed. | Injured. | One Killed in | One Injured in |
| 1840 to 1843 . . . . .  | 54,134                      | 99      | 70       | 547           | 773            |
| 1844 ... 1847 . . . . . | 96,548                      | 223     | 123      | 433           | 785            |
| 1848 ... 1851 . . . . . | 209,000                     | 361     | 147      | 579           | 1,422          |
| 1840 to 1851 . . . . .  | 359,682                     | 683     | 340      | 527           | 1,058          |
| 1852 . . . . .          | 64,619                      | 82      | 46       | 788           | 1,405          |
| Grand Total . . . . .   | 424,301                     | 765     | 386      | 555           | 1,099          |

This Abstract presents facts of a very remarkable nature when compared with those given in Abstract H, page 247 *ante*. In the preceding Abstract, it will be seen that, in the first group of employés, consisting of engine-drivers, stokers, and guards, the numbers of injuries and deaths are almost identical, while amongst passengers (see Abstract O) the ratio of injured to killed was 675·20 per cent.

In regard, however, to the group consisting of porters and other servants, the number killed has been 1 in 555, and the number injured has been 1 in 1,099; or the ratio of injured to killed about 50·46 per cent.

In this way of looking at the question, some results are disclosed, which merit very serious consideration.

## ABSTRACT O.

| Class.                                        | Numbers. |          | Ratio of Injured to Killed. |
|-----------------------------------------------|----------|----------|-----------------------------|
|                                               | Killed.  | Injured. |                             |
| Engine Drivers, Stokers, and Guards . . . . . | 316      | 317      | About equal                 |
| Porters and Other Servants . . . . .          | 765      | 386      | 50·46 per cent.             |
| Passengers . . . . .                          | 266      | 1,796    | 675·20 ...                  |



There appears in this Abstract a very curious law, but one which, on reflection, is quite consistent with the circumstances known to influence the risk to which each class of persons is exposed. By viewing, in connection with the preceding results, some of the facts set forth in Abstract O, the following conclusions are arrived at:—

ABSTRACT P.

| Class of Persons exposed to Risk.             | Numbers. |          | Ratio of the Injured to Killed. |
|-----------------------------------------------|----------|----------|---------------------------------|
|                                               | Killed.  | Injured. |                                 |
| Trespassers . . . . .                         | 306      | 84       | 27·45 per cent.                 |
| Public by their own negligence . . . . .      | 175      | 65       | 37·14 ...                       |
| Other Servants . . . . .                      | 648      | 321      | 49·54 ...                       |
| Porters and other Servants . . . . .          | 765      | 386      | 50·46 ...                       |
| Porters . . . . .                             | 117      | 65       | 55·56 ...                       |
| Engine-Drivers, Stokers, and Guards . . . . . | 316      | 317      | About equal                     |
| Passengers . . . . .                          | 266      | 1,796    | 675·20 ...                      |

A very slight consideration of the nature of the circumstances, under which the accidents take place in each of the above classes, will at once explain the great disparity between the ratio of the killed and injured. If the different circumstances in which the two classes of trespassers and passengers be contrasted, it will at once appear that, in the event of an accident occurring, the chances of its proving fatal differ widely in the two groups; the former being injured principally by trains overtaking them while in motion, and consequently the probability of the accident proving fatal is very great; but, in regard to the latter, it has been shewn in Table IV, that the bulk of accidents to passengers take place under circumstances of a much less violent nature, in which the tendency to be fatal is quite inconsiderable compared with the accidents to which trespassers are liable. Of the 297 fatal accidents by defined causes to trespassers recorded in Table VI, no less than 268 are assignable to the cause "run over;" while, of the 228 fatal accidents to passengers, 99, or 43·42 per cent., have been occasioned by collisions of trains, and trains running off the line. Accidents of this kind, it will be found, are of a less violent nature than any other, and have, therefore, less tendency to be fatal; and if these facts be kept distinctly in view, the great disparity in the relative fatality of accidents in different classes, as shewn in Abstract P, will be readily understood. The following illustration of the tendency of different classes of accidents to prove fatal, so far as passengers are concerned, may be interesting and instructive on this point of the inquiry:—



## ABSTRACT Q.

*Ratio amongst Passengers of Injured to Killed from different causes.*

| Causes.                                                 | Killed. | Injured. | Ratio of Injured to Killed. |
|---------------------------------------------------------|---------|----------|-----------------------------|
| Collisions, running off line, and collision at stations | 99      | 1,505    | 1520·20 per cent.           |
| All other defined causes . . . . .                      | 129     | 230      | 178·29 ...                  |

Accidents from the last group of causes, it will be seen, are of a much more fatal character than those in the first group; and an inspection of the causes, included in the last of the above groups, will shew that they are of a kind more in common with those which affect railway servants in general, than the causes contained in the first group; and hence the explanation of the disparity exhibited in Abstract P preceding.

Abstract R gives a succinct view of the liability of different classes of persons to be injured by accidents from various causes, and also the chances of those accidents proving fatal; and it will be seen, that, in the following classes, the great bulk of the accidents take place under circumstances in which the cause of injury is of a very violent nature, and can, with few exceptions, be scarcely otherwise than fatal:—

|                           |                                          |                 |                                                |
|---------------------------|------------------------------------------|-----------------|------------------------------------------------|
| Of all the deaths amongst | Trespassers . . . . .                    | 90·24 per cent. | } Have occurred from being run over by trains. |
|                           | Public by their own negligence . . . . . | 88·66 ...       |                                                |
|                           | Other Servants . . . . .                 | 61·50 ...       |                                                |
|                           | Porters . . . . .                        | 30·39 ...       |                                                |

Again, it will be seen, that, in the following classes of the accidents also taking place under circumstances likely to be fatal:—

|                     |                |                 |                                                                                |
|---------------------|----------------|-----------------|--------------------------------------------------------------------------------|
| Of the deaths among | Engine-Drivers | 46·03 per cent. | { Are caused by "Running off the Line" and "Falling from Train."               |
| ...                 | Stokers        | 52·96 ...       | "Running off Line," "Falling from Train," and "Crushed."                       |
| ...                 | Guards         | 82·21 ...       | { "Falling from Train," "Mounting Train in Motion," "Run over," and "Crushed." |
| ...                 | Porters        | 70·58 ...       | "Run over" and "Crushed."                                                      |

These facts are sufficient to account for the tendency of different kinds of accidents, as they affect different classes of persons, to prove fatal. In Abstract Q, it will be found, that accidents to passengers from "collisions," "running off the line," and "collisions at stations," were much less fatal than those taking place from other causes; so also will it be found that, amongst the three important classes of railway servants, engine-drivers, stokers, and guards, the accidents from the same three causes are much less fatal than those from other causes.



## ABSTRACT R.

*Number of Deaths from each cause amongst different classes, also the Ratio of Deaths from each cause to the Total Deaths from all causes for the whole period, 1840-52.*

| Cause.                             | Passengers.    |        | Public by their own Negligence. |        | Trespassers.   |        | Engine-Drivers. |        | Stokers.       |        | Guards.        |        | Porters.       |        | Other Servants. |        |
|------------------------------------|----------------|--------|---------------------------------|--------|----------------|--------|-----------------|--------|----------------|--------|----------------|--------|----------------|--------|-----------------|--------|
|                                    | Number Killed. | Ratio. | Number Killed.                  | Ratio. | Number Killed. | Ratio. | Number Killed.  | Ratio. | Number Killed. | Ratio. | Number Killed. | Ratio. | Number Killed. | Ratio. | Number Killed.  | Ratio. |
| Collision . . . . .                | 29             | 12.72  | ...                             | ...    | ...            | ...    | 6               | 9.52   | 8              | 7.92   | 3              | 3.34   | ...            | ...    | 11              | 1.92   |
| Off line . . . . .                 | 35             | 15.35  | ...                             | ...    | ...            | ...    | 19              | 30.16  | 13             | 12.87  | 6              | 6.67   | 1              | .98    | 6               | 1.05   |
| Running into station . . . . .     | 5              | 2.20   | ...                             | ...    | ...            | ...    | 1               | 1.59   | ...            | ...    | ...            | ...    | ...            | ...    | ...             | ...    |
| Axle breaking . . . . .            | 6              | 2.63   | ...                             | ...    | ...            | ...    | ...             | ...    | ...            | ...    | ...            | ...    | ...            | ...    | 4               | .70    |
| Machinery breaking . . . . .       | 2              | .88    | ...                             | ...    | 1              | .34    | 7               | 11.11  | 11             | 10.89  | 1              | 1.11   | ...            | ...    | 5               | .86    |
| Falling from train . . . . .       | 16             | 7.02   | 6                               | 4.00   | 8              | 2.69   | 10              | 15.87  | 28             | 27.72  | 37             | 41.11  | 10             | 9.80   | 56              | 9.76   |
| Jumping from train . . . . .       | 34             | 14.91  | 4                               | 2.67   | 1              | .33    | 3               | 4.76   | 5              | 4.95   | 2              | 2.22   | 6              | 5.89   | 24              | 4.18   |
| Run over . . . . .                 | 22             | 9.65   | 133                             | 88.66  | 268            | 90.24  | 4               | 6.35   | 11             | 10.89  | 13             | 14.44  | 31             | 30.39  | 353             | 61.50  |
| Collision at station . . . . .     | 35             | 15.35  | ...                             | ...    | ...            | ...    | 6               | 9.53   | 5              | 4.95   | 4              | 4.45   | 4              | 3.92   | 8               | 1.39   |
| Mounting train in motion . . . . . | 39             | 17.10  | 3                               | 2.00   | 10             | 3.37   | 4               | 6.35   | 7              | 6.94   | 10             | 11.11  | 9              | 8.83   | 35              | 6.10   |
| Crushed . . . . .                  | 5              | 2.19   | 4                               | 2.67   | 9              | 3.03   | 3               | 4.76   | 13             | 12.87  | 14             | 15.55  | 41             | 40.19  | 72              | 12.54  |
| Total . . . . .                    | 228            | 100.00 | 150                             | 100.00 | 297            | 100.00 | 63              | 100.00 | 101            | 100.00 | 90             | 100.00 | 102            | 100.00 | 574             | 100.00 |
| Miscellaneous . . . . .            | 38             | ...    | 25                              | ...    | 9              | ...    | 10              | ...    | 15             | ...    | 37             | ...    | 15             | ...    | 74              | ...    |



## ABSTRACT S.

*Ratio of Injured to Killed amongst Engine-Drivers, Stokers, and Guards, from different causes.*

| CAUSES.                                                             | Killed. | Injured. | Ratio of Injured to Killed. |
|---------------------------------------------------------------------|---------|----------|-----------------------------|
| Collisions, running off line, and }<br>Collisions at stations . . } | 70      | 118      | 168.57 per cent.            |
| All other causes . . . . .                                          | 246     | 199      | 80.89 ...                   |

It is hence obvious, not only as regards employés, but also passengers, that accidents from "collisions," and from "running off the line," are neither so frequent nor so fatal as has been hitherto so generally believed by the public.

The next point connected with this part of the inquiry, to which attention is directed, is the relative frequency of fatal accidents in recent and more remote years; and, for the purpose of ascertaining how far the tendency to fatal accidents has increased or diminished amongst employés, the following Abstract has been prepared, which shews the deaths from all causes in the aggregate among

## ABSTRACT T.

| PERIOD.       | Engine Drivers, Stokers and Guards. |         |               | Porters and other Servants. |         |               |
|---------------|-------------------------------------|---------|---------------|-----------------------------|---------|---------------|
|               | Number Exposed to Risk.             | Killed. | One Killed in | Number Exposed to Risk.     | Killed. | One Killed in |
| 1840 to 1843  | 6,080                               | 27      | 225           | 54,134                      | 99      | 547           |
| 1844 ... 1847 | 10,852                              | 100     | 109           | 96,548                      | 223     | 433           |
| 1848 ... 1851 | 23,454                              | 148     | 158           | 209,000                     | 361     | 579           |
| 1852 . . . .  | 7,252                               | 41      | 177           | 64,619                      | 82      | 788           |
| 1840 to 1852  | 47,638                              | 316     | 151           | 424,301                     | 765     | 555           |

When a similar investigation was made into the relative frequency of fatal accidents to passengers, in Abstract H, it was most satisfactory to find so rapid and so decided a diminution of them in recent years. But, although in the present instance it would appear that, among railway servants, the mortality from accidents was not so high in the first as in the period immediately succeeding, still it is gratifying to find a still more marked and decided diminution in the rate of mortality among railway servants since the year 1844, than has taken place even amongst passengers. According to Abstract H, it will be found that the decrease in mortality of passengers, within the same period, was in the ratio of one in 230 to one in 289; while, amongst the group "Engine Drivers, Stokers, and Guards," the decrease has been in the ratio of one in 109 to one in 177; but if the ratio had been in accordance with that for passengers, it would have been as 109 to 137 only. Again, in the group "Porters and other Servants," the decrease of mortality has been as one in 433 to one in 788; but if the ratio had been the same as that for passengers, it would



have been as one in 433 to one in 544 only. It will thus be seen that the diminution of fatal accidents among the second group of railway servants is somewhat greater than in even the first group.

Few, if any persons, were, until recently, distinctly aware of the great diminution of fatal accidents amongst railway passengers; but the facts in Abstract H, of the former paper, have now sufficiently established the truth of the great improvements in this respect of railway travelling in recent years; and the evidence now brought forward in Abstract T is of a still more satisfactory and welcome nature; for while, in the period under review, the mortality of railway passengers has diminished 21 per cent., that of railway servants, taking both groups, has, in the same time, decreased no less than 78 per cent. It must hence be evident to every inquirer that great improvement in the management of the railway system of this country has taken place within the last ten years, to whatever cause that improvement may be due. The risk of life and limb has greatly diminished among all classes, whether travellers or employés.

In the former part of this paper, an ample illustration was given of the distinction intended to be drawn between accidents "beyond control of the companies" and those "under control of the companies;" and that part of the question was sufficiently discussed, so far as passengers are concerned. It is now proposed to investigate it in relation to employés.

The following Abstract furnishes the principal facts for the period 1840-51:—

#### ABSTRACT U.

*Deaths amongst Employés from causes Beyond Control of Companies, also from causes Under Control of Companies, 1840—51.*

| Causes.                                                           | Class of Persons. |          |          |          |         |          |          |          |                 |          |
|-------------------------------------------------------------------|-------------------|----------|----------|----------|---------|----------|----------|----------|-----------------|----------|
|                                                                   | Engine Drivers.   |          | Stokers. |          | Guards. |          | Porters. |          | Other Servants. |          |
|                                                                   | Killed.           | Injured. | Killed.  | Injured. | Killed. | Injured. | Killed.  | Injured. | Killed.         | Injured. |
| (a)—Beyond control of the Companies                               | 24                | 31       | 56       | 42       | 61      | 27       | 46       | 15       | 438             | 143      |
| (b)—Under control of the Companies, including Miscellaneous . . . | 38                | 53       | 42       | 64       | 54      | 57       | 52       | 41       | 147             | 141      |
| Per centage of (a) .                                              | 38·71             | 36·90    | 57·14    | 39·62    | 53·04   | 32·14    | 46·94    | 26·79    | 74·87           | 50·35    |
| Per centage of (b) .                                              | 61·29             | 63·10    | 42·86    | 60·38    | 46·96   | 67·86    | 53·06    | 73·21    | 24·13           | 49·65    |

In Abstract I, page 258 *ante*, the fatal accidents to passengers, assumed to be "under control" of the companies, were found to be 55·3 per cent. of the whole; but in this Abstract it will be seen, that, with the exception of the class "Engine Drivers," the ratio of accidents "under control of the companies" is, on the whole, considerably under that for passengers. In the preceding Abstract, the accidents in the miscellaneous



or unclassified group are placed among those "under control of the companies;" but the more correct mode of comparison is clearly, for the reasons assigned in page 259 *ante*, to exclude them; and, therefore, in the next Abstract, which has been prepared to shew whether the accidents, assumed to arise from causes "under control of the companies," be increasing or diminishing, the miscellaneous group is not taken into account:—

## ABSTRACT V.

*Deaths among Different Classes of Employés, shewing those from causes beyond the Control of the Companies, and those not under such Control.*

| Causes.                                                 | Engine Drivers, Stokers and Guards. |          |          | Porters and Other Servants. |          |          |
|---------------------------------------------------------|-------------------------------------|----------|----------|-----------------------------|----------|----------|
|                                                         | 1840-43.                            | 1844-47. | 1848-51. | 1840-43.                    | 1844-47. | 1848-51. |
| Beyond control of Company .                             | 19                                  | 44       | 78       | 80                          | 177      | 227      |
| Under control of Company, excluding Miscellaneous . . } | 3                                   | 36       | 42       | 15                          | 32       | 77       |
| Mortality per Cent. of each Class to the Total.         |                                     |          |          |                             |          |          |
| Beyond control of Company . .                           | 86.37                               | 55.00    | 65.00    | 84.21                       | 84.69    | 74.67    |
| Under control of Company, excluding Miscellaneous . . } | 13.63                               | 45.00    | 35.00    | 15.79                       | 15.31    | 25.33    |

If the results in this be compared with those in the preceding Abstract, a very important distinction will be observable, the ratio of accidents assumed as "under control of the companies" being very much less, in consequence of the group of accidents in the miscellaneous or undefined groups being excluded. But there is one feature appearing in Abstract V of anything but a satisfactory nature, namely, that the ratio of accidents "under control of the companies," in reference to the total deaths from all causes, have, contrary to that which was found to prevail in Abstract J in regard to passengers, been increasing. In page 256 *ante*, however, while describing Table XXI, it was clearly shewn that, although such modes of exhibiting the relation of statistical facts have their uses, serious objections may still be brought against them when any exact or strict investigation is attempted. In order, therefore, to avoid such objections, the following Table has been prepared on the plan of Abstract K, and similar in some respects to Table XXXV, only that the accidents arising from causes "under control of companies" are distinguished from those considered as "beyond the control of companies." The first section shews the ratio of deaths from causes "beyond" and "under" control of the companies, in the same manner as that followed in Abstract V, only more in detail; but the second section of the same Table furnishes the exact ratio of mortality per annum to the numbers exposed to risk in each class of employés:—

[The second



*Number and Ratio per Cent. of Deaths from causes Beyond and Under Control of the Companies to the Total Deaths from all ascertained causes, for each Class of Employés.*

*Exact Rate of Mortality per Annum to the Number Exposed to Risk in each Class.*

| Causes.                                            | Deaths of Engine Drivers. |               |               | Deaths of Stokers. |               |               | Deaths of Guards. |               |               | Deaths of Porters. |                 |                 | Deaths of other Servants. |               |               |
|----------------------------------------------------|---------------------------|---------------|---------------|--------------------|---------------|---------------|-------------------|---------------|---------------|--------------------|-----------------|-----------------|---------------------------|---------------|---------------|
|                                                    | 1840-43.                  | 1844-47.      | 1848-51.      | 1840-43.           | 1844-47.      | 1848-51.      | 1840-43.          | 1844-47.      | 1848-51.      | 1840-43.           | 1844-47.        | 1848-51.        | 1840-43.                  | 1844-47.      | 1848-51.      |
| Number exposed to risk . . . . .                   | 2,051                     | 3,658         | 7,910         | 2,127              | 3,800         | 8,205         | 1,902             | 3,394         | 7,339         | 8,985              | 16,037          | 34,677          | 45,149                    | 80,511        | 174,323       |
| Beyond control of Compa-<br>nies . . . . .         | 6                         | 8             | 10            | 6                  | 21            | 29            | 7                 | 15            | 39            | 8                  | 15              | 23              | 72                        | 162           | 204           |
| Under control of Compa-<br>nies . . . . .          | 1                         | 17            | 11            | 1                  | 13            | 15            | 1                 | 6             | 16            | 6                  | 12              | 20              | 9                         | 20            | 57            |
| Ratio of, Beyond control<br>of Companies . . . . . | One in<br>342             | One in<br>457 | One in<br>791 | One in<br>354      | One in<br>181 | One in<br>283 | One in<br>272     | One in<br>226 | One in<br>188 | One in<br>1,123    | One in<br>1,069 | One in<br>1,508 | One in<br>627             | One in<br>497 | One in<br>855 |
| Ratio of, Under control of<br>Companies . . . . .  | 2,051                     | 215           | 719           | 2,127              | 292           | 547           | 1,902             | 566           | 459           | 1,497              | 1,326           | 1,734           | 5,017                     | 4,026         | 3,058         |



The second section of this Table is calculated to throw important light on the question of railway accidents, as they affect the different classes of employés, both as regards the causes "beyond control of the companies" and those assumed to fall "under control of the companies." In describing Abstract T, it was pointed out that, ever since 1844, the accidents from all causes have been diminishing; so also, in the preceding Table, it will be found that generally in each class of servants the fatal accidents have been decreasing within the same period, whether viewed in respect to the causes "beyond control of the companies" or otherwise, the exceptions being in the group of "guards," and in the group of "other servants" for accident from causes "under control of companies." The following Abstract, however, of this Table will place the question in a clearer light:—

## ABSTRACT W.

*Ratio of Deaths amongst Employés from causes Beyond and Under Control of the Companies, 1840-51.*

|                                                    | Engine Drivers,<br>Stokers, and Guards. |                     |                     | Porters and other Servants. |                     |                     | Engine Drivers,<br>Stokers, Guards, Porters, and<br>other Servants. |                     |                     |
|----------------------------------------------------|-----------------------------------------|---------------------|---------------------|-----------------------------|---------------------|---------------------|---------------------------------------------------------------------|---------------------|---------------------|
|                                                    | 1840<br>to<br>1843.                     | 1844<br>to<br>1847. | 1848<br>to<br>1851. | 1840<br>to<br>1843.         | 1844<br>to<br>1847. | 1848<br>to<br>1851. | 1840<br>to<br>1843.                                                 | 1844<br>to<br>1847. | 1848<br>to<br>1851. |
| Number exposed to risk . . .                       | 6,080                                   | 10,852              | 23,454              | 54,134                      | 96,548              | 209,000             | 60,214                                                              | 107,400             | 232,454             |
| Beyond control of Companies                        | 19                                      | 44                  | 78                  | 80                          | 177                 | 227                 | 99                                                                  | 221                 | 305                 |
| Under control of Companies                         | 3                                       | 36                  | 42                  | 15                          | 32                  | 77                  | 18                                                                  | 68                  | 119                 |
| Ratio of, Beyond control of<br>Companies . . . . . | One in<br>320                           | One in<br>247       | One in<br>301       | One in<br>677               | One in<br>545       | One in<br>921       | One in<br>608                                                       | One in<br>486       | One in<br>762       |
| Ratio of, Under control of<br>Companies . . . . .  | 2,027                                   | 302                 | 558                 | 3,609                       | 3,017               | 2,714               | 3,345                                                               | 1,579               | 1,953               |

It is thus obvious that, so far as engine-drivers, stokers, and guards are concerned, there has been a decided decrease in the accidents, both from causes "beyond" and "under" control of the companies, and, consequently, an absolute decrease in the mortality from all causes; but in the case of porters and other servants, it will be found that, while the deaths from causes "beyond the control of companies" have diminished in a very marked manner, those from causes "under control of the companies" have increased. In the last section of the preceding Abstract, it will, however, be seen that, viewing all the railway employés in the aggregate, there has been a decided decrease in the deaths from both classes of accidents, whether from causes beyond or under control of the companies. In Abstract K, it will be found that, among passengers, although the deaths from all causes had largely decreased since 1844, still those from causes "beyond the control of the companies," in that period, increased, but not in so great a ratio as the deaths from causes "under the control of the companies," had diminished. The decrease from causes "under the control of the companies," it will be observed, by comparing the results of Abstract R for passengers with those of Abstract W for employés, is very nearly



the same within the period 1844-51. From the principle on which Tables XXXI, XXXII, and XXXIII, have been formed, it is questionable whether the number of employés therein deduced as being in the service of the companies prior to the year 1844, can be safely relied on, although subsequent to that period they may be considered as strictly applicable to the purposes to which they have been applied in this contribution; in fact, subsequent to 1847, a census has been taken in the alternate years. Looking, however, at the figures determined for the years 1840-43, it is to be doubted whether the number of employés then in actual service was not much less than stated in the Tables just referred to. For other reasons than those appearing from an examination of the figures in Table XXXIII, it may be fairly assumed that, in the early period of railway management, a less number of employés was required in the railway service, *pro rata* to the extent of the line of railway open to traffic; for it has already been shewn, in the early part of this communication, that both the passenger and goods traffic have increased in a much higher ratio than the extent of miles of railway open for traffic, and, consequently, the number of railway employés has also increased in a like high ratio. This is an important consideration to bear in mind while engaged on this part of the inquiry which relates to employés only. The same difficulty did not arise while engaged in the examination of a similar question in respect to passengers, for the number of passengers and the extent of mileage were known for each year of the whole period under observation; but, as already stated, no census of railway employés was available for the purpose of this inquiry until May, 1848. Assuming that the remarks now advanced, in respect to the estimated number of employés given in Table XXXIII, are generally correct, it will follow that the actual rate of mortality among railway employés, for the period 1840-43, was much greater than that shewn in the preceding Tables and Abstracts, and hence, in the present state of the investigation of this question, it would be difficult to assert positively whether, as in the case of passengers, the mortality of employés has not also uniformly diminished ever since 1840, notwithstanding the indications to the contrary contained in Table XXXVI and Abstract W.

Whatever opinions may be held as to the improvements likely to take place in railway management for the future, for the protection of the lives of passengers and employés, one thing is quite certain, that in the period within which observations and recorded facts may be safely relied on, great improvements must have been effected in the management of railway affairs; and more credit is due to those intrusted with the conduct of these matters than either the public press or the people of this country have for a long time seemed disposed to accord to them.

In pages 260-1 *ante*, will be found important facts and deductions in relation to "collisions;" and although that portion of the inquiry had special reference to passengers, many of the observations are equally applicable to the case of employés. The following Table exhibits the number of deaths taking place from collisions at stations, and from collisions not at stations, during the period 1844-51:—

[It will be



TABLE XXXVII.

*The Number and Ratio of Deaths from Collisions happening at Stations, and from Collisions not at Stations, during the Years 1844-52, among*

| Period.                 | Engine Drivers. |                 |        |             |        |
|-------------------------|-----------------|-----------------|--------|-------------|--------|
|                         | Number.         | Not at Station. |        | At Station. |        |
|                         |                 | Killed.         | One in | Killed.     | One in |
| 1844 to 1847 . . . . .  | 3,658           | 4               | 914    | 2           | 1,829  |
| 1848 ... 1851 . . . . . | 7,910           | 2               | 3,955  | 1           | 7,910  |
| 1852 . . . . .          | 2,446           | ...             | ...    | 3           | 815    |
| 1844 to 1852 . . . . .  | 14,014          | 6               | 2,336  | 6           | 2,336  |
| Period.                 | Stokers.        |                 |        |             |        |
|                         | Number.         | Not at Station. |        | At Station. |        |
|                         |                 | Killed.         | One in | Killed.     | One in |
| 1844 to 1847 . . . . .  | 3,800           | 2               | 1,900  | 2           | 1,900  |
| 1848 ... 1851 . . . . . | 8,205           | 3               | 2,735  | 2           | 4,102  |
| 1852 . . . . .          | 2,537           | 2               | 1,268  | 1           | 2,537  |
| 1844 to 1852 . . . . .  | 14,542          | 7               | 2,077  | 5           | 2,908  |
| Period.                 | Guards.         |                 |        |             |        |
|                         | Number.         | Not at Station. |        | At Station. |        |
|                         |                 | Killed.         | One in | Killed.     | One in |
| 1844 to 1847 . . . . .  | 3,394           | 2               | 1,697  | 1           | 3,394  |
| 1848 ... 1851 . . . . . | 7,339           | 1               | 7,339  | 3           | 2,446  |
| 1852 . . . . .          | 2,269           | ...             | ...    | ...         | ...    |
| 1844 to 1852 . . . . .  | 13,002          | 3               | 4,334  | 4           | 3,251  |
| Period.                 | Porters.        |                 |        |             |        |
|                         | Number.         | Not at Station. |        | At Station. |        |
|                         |                 | Killed.         | One in | Killed.     | One in |
| 1844 to 1847 . . . . .  | 16,037          | ...             | ...    | 2           | 8,018  |
| 1848 ... 1851 . . . . . | 34,677          | ...             | ...    | 1           | 34,677 |
| 1852 . . . . .          | 10,722          | ...             | ...    | 1           | 10,722 |
| 1844 to 1852 . . . . .  | 61,436          | ...             | ...    | 4           | 15,359 |
| Period.                 | Other Servants. |                 |        |             |        |
|                         | Number.         | Not at Station. |        | At Station. |        |
|                         |                 | Killed.         | One in | Killed.     | One in |
| 1844 to 1847 . . . . .  | 80,511          | 2               | 40,255 | 1           | 80,511 |
| 1848 ... 1851 . . . . . | 174,323         | 4               | 43,581 | 7           | 24,903 |
| 1852 . . . . .          | 53,897          | 5               | 10,779 | ...         | ...    |
| 1844 to 1852 . . . . .  | 308,731         | 11              | 28,066 | 8           | 38,591 |



It will be seen that this class of accidents, which, in the case of passengers, was shewn, at page 260, to constitute nearly 59 per cent. of all accidents assumed to be under the control of the companies, does, in regard to employés, amount to little more than 21 per cent. of all the accidents arising from causes under the control of the companies; and this is a distinction which it is of much importance to keep in view, as it is calculated to throw much light on the proximate cause of accidents in railways, and the direction in which improvements are more immediately to be looked for. With this object in view, the following Abstract has been prepared, shewing, in reference to the causes assumed to be under control of the companies, the degree in which each particular class of employés is subject to each kind of accident, as well as the relation between each class of employés, and also all employés in the aggregate, to passengers in this respect:—

#### ABSTRACT X.

*The Number of Deaths amongst Railway Employés, and amongst Passengers, during the Years 1840-52, from Accidents under Control of the Companies.*

| CAUSE OF ACCIDENT.     | Class of Employés. |          |         |          |                 |                    | Passengers. |
|------------------------|--------------------|----------|---------|----------|-----------------|--------------------|-------------|
|                        | Engine Drivers.    | Stokers. | Guards. | Porters. | Other Servants. | Total of Employés. |             |
| Collision . . . . .    | 6                  | 8        | 3       | ...      | 11              | 28                 | 29          |
| Off line . . . . .     | 19                 | 13       | 6       | 1        | 6               | 45                 | 35          |
| Running into station . | 1                  | ...      | ...     | ...      | ...             | 1                  | 5           |
| Collision at station . | 6                  | 5        | 4       | 4        | 8               | 27                 | 35          |
| Crushed . . . . .      | 3                  | 13       | 14      | 41       | 72              | 143                | 5           |
| Total . . . . .        | 35                 | 39       | 27      | 46       | 97              | 244                | 109         |

Accidents from collisions are, relatively to the whole of the above class of accidents, obviously not so fatal to any one class of railway servants, nor consequently to the whole collectively, as to passengers.

In the former part of this paper a very complete investigation has been made of the various circumstances under which collisions took place, distinguishing those collisions at stations from those not at stations, and also those in which the immediate cause was the state of the weather, defects in machinery, neglect, and other circumstances; besides, it was further shewn to what extent the various accidents from collisions arose from passenger trains running into other passenger trains, from passenger trains into trains of another sort, from trains other than passenger trains into passenger trains, and from trains, neither of which were passenger trains. And although the data there brought forward have more especial reference to the injuries sustained by passengers, the facts are quite as completely given in regard to employés themselves; and it is therefore now unnecessary to enlarge on the particular questions then discussed. In respect, however, to the preceding Abstract of this group of accidents, namely, those assumed to be under control of the



companies, the following modification in the way of exhibiting the results will shew the relative frequency of each kind of accident to all causes of the same group of accidents.

## ABSTRACT Y.

*Ratio of Deaths amongst each Class of Railway Employés and amongst Passengers, during the Years 1840—52, from each kind of Accident Under Control of the Companies, to the Deaths from all causes assumed as being Under Control of the Companies.*

| CAUSE OF ACCIDENT.     | Class of Employés. |          |         |          |                 |                    | Passengers. |
|------------------------|--------------------|----------|---------|----------|-----------------|--------------------|-------------|
|                        | Engine Drivers.    | Stokers. | Guards. | Porters. | Other Servants. | Total of Employés. |             |
| Collision . . . . .    | 17·14              | 20·52    | 11·11   | ...      | 11·34           | 11·47              | 26·60       |
| Off line . . . . .     | 54·29              | 33·33    | 22·22   | 2·17     | 6·18            | 18·44              | 32·11       |
| Running into station . | 2·86               | ...      | ...     | ...      | ...             | 0·41               | 4·59        |
| Collision at station . | 17·14              | 12·82    | 14·82   | 8·70     | 8·25            | 11·07              | 32·11       |
| Crushed . . . . .      | 8·57               | 33·33    | 51·85   | 89·13    | 74·23           | 58·61              | 4·59        |

The following are the causes amongst those assumed to be under control of the companies, which are most fatal to each class of persons, viz. :—

In the class—

|                          |                                                    |                                             |     |     |
|--------------------------|----------------------------------------------------|---------------------------------------------|-----|-----|
| Engine Drivers . . . . . | Running off line . . . . .                         | = 54·3 per cent. of the whole of the above. |     |     |
| Stokers . . . . .        | Collisions, Off line, and Crushed are equal = 33·3 | ...                                         | ... |     |
| Guards . . . . .         | Crushed. . . . .                                   | = 51·9                                      | ... | ... |
| Porters . . . . .        | Do. . . . .                                        | = 89·1                                      | ... | ... |
| Other Servants . . . . . | Do. . . . .                                        | = 74·2                                      | ... | ... |
| Total Employés . . . . . | Do. . . . .                                        | = 58·6                                      | ... | ... |
| Passengers . . . . .     | Collisions . . . . .                               | = 58·7                                      | ... | ... |

Of the accidents under control of the companies, it is remarkable how great a proportion of the deaths among employés comes under the denomination "crushed," particularly amongst porters and other servants. Even in the whole group of employés the ratio from this cause is as high as 58·61 per cent., while amongst passengers it is no more than 4·59 per cent.; and, therefore, by keeping these facts in view, there can be no difficulty in understanding the great discrepancy between the ratio of killed and injured among employés and passengers.

Having said this much in regard to the way in which different classes of persons are affected by different kinds of accidents, we shall now return to the subject of Table XXXVII. The following is a condensed Abstract of it, and will afford a ready means of judging how far fatal accidents from collisions have decreased in recent years.



## ABSTRACT Z.

*Ratio of Fatal Accidents from Collisions at different periods amongst Railway Employés.*

| Period. | Engine Drivers, Stokers, and Guards. |                 |        |             |        | Porters and other Servants. |                 |        |             |        |
|---------|--------------------------------------|-----------------|--------|-------------|--------|-----------------------------|-----------------|--------|-------------|--------|
|         | Number Exposed to Risk.              | Not at Station. |        | At Station. |        | Number Exposed to Risk.     | Not at Station. |        | At Station. |        |
|         |                                      | Killed.         | One in | Killed.     | One in |                             | Killed.         | One in | Killed.     | One in |
| 1844-47 | 10,852                               | 8               | 1,356  | 5           | 2,170  | 96,548                      | 2               | 48,274 | 3           | 32,183 |
| 1848-51 | 23,454                               | 6               | 3,909  | 6           | 3,909  | 209,000                     | 4               | 52,250 | 8           | 26,125 |
| 1852    | 7,252                                | 2               | 3,626  | 4           | 1,813  | 64,619                      | 5               | 12,924 | 1           | 64,619 |
| 1844-52 | 41,558                               | 16              | 2,597  | 15          | 2,770  | 370,167                     | 11              | 33,651 | 12          | 30,847 |

It is hence obvious that so far as the first group of servants are concerned, the danger of fatal accidents from collisions of both kinds has greatly decreased in recent years, but in regard to collisions at stations such has not been the case amongst the other group of railway servants, namely, "porters and other servants."

The next part of this question to which attention is directed is similar to that contained in Abstract M of the preceding paper, which shewed the accidents which had happened to passengers from collisions with trains of different kinds. At page 270 it will be found that throughout the whole period of nine years, 1844-52, but one death of a passenger took place from collisions of "express" trains, and also only one from collisions of "excursion," while none happened from collisions of mail trains, the "ordinary" trains being most fatal to passengers; so also will the same thing be found with regard to *employés*. The following condensed Abstract from Table XXV gives a general view of the results arrived at.

## ABSTRACT Aa.

*Ratio of Deaths and Injuries amongst Employés to the Number of Collisions during 1844-52.*

| TRAINS.             | Collisions.  |          | Employés. |          | Ratio of Deaths and Injuries to |          |                     |          |
|---------------------|--------------|----------|-----------|----------|---------------------------------|----------|---------------------|----------|
|                     | Non-Serious. | Serious. | Killed.   | Injured. | All Collisions.                 |          | Serious Collisions. |          |
|                     |              |          |           |          | Killed.                         | Injured. | Killed.             | Injured. |
| Express . . . . .   | 3            | 8        | 2         | 11       | ·182                            | 1·000    | ·250                | 1·375    |
| Excursion . . . . . | 1            | 7        | ...       | ...      | ...                             | ...      | ...                 | ...      |
| Mail . . . . .      | 8            | 13       | 4         | 8        | ·190                            | ·381     | ·308                | ·615     |
| Ordinary . . . . .  | 42           | 173      | 22        | 57       | ·102                            | ·265     | ·127                | ·329     |
| Total . . . . .     | 54           | 201      | 28        | 76       | ·110                            | ·298     | ·139                | ·378     |

Although the "ordinary" trains have had the greatest number of collisions, and have



also suffered most from this class of accidents, yet when a collision of either an "express" or a "mail" train has taken place, it has proved more fatal to employés than a collision of an "ordinary train;" but on referring to Abstract M the reverse will be found to have been the case in regard to passengers, the collisions of "ordinary" trains being not only more frequent but also more severe and fatal than those of "express," "excursion," and "mail" trains.

In regard to the tendency which accidents from collisions have had since the year 1844, to occasion a greater or a less ratio of non-fatal injuries amongst employés, it will be seen from the following Abstract that in the classes "Engine Drivers" and "Guards" there has been a marked and most decided decrease, varying, amongst engine-drivers, from one in 366 to one in 805 per annum, and amongst guards from one in 566 to one in 1,135. In the class "Stokers," however, which appears much more liable to accidents of this kind than the other two classes, it will be observed that during the period 1848-51 the ratio of injuries was less than in either the preceding or subsequent period, but still, while the ratio was as high as one in 292 in the first period, it became reduced to one in 507 in 1852.

## ABSTRACT Ab.

*The Number and Ratio of Injuries from Collisions happening at Stations, and from Collisions not at Stations, during the Years 1844-52, among*

| Period.             | Engine Drivers. |          |        | Stokers. |          |        | Guards. |          |        |
|---------------------|-----------------|----------|--------|----------|----------|--------|---------|----------|--------|
|                     | Number.         | Injured. | One in | Number.  | Injured. | One in | Number. | Injured. | One in |
| 1844 to 1847 . . .  | 3,658           | 10       | 366    | 3,800    | 13       | 292    | 3,394   | 6        | 566    |
| 1848 ... 1851 . . . | 7,910           | 10       | 791    | 8,205    | 8        | 1,026  | 7,339   | 8        | 917    |
| 1852 . . . . .      | 2,416           | 3        | 805    | 2,537    | 5        | 507    | 2,269   | 2        | 1,135  |
| 1844 to 1852 . . .  | 14,014          | 23       | 609    | 14,542   | 26       | 559    | 13,002  | 16       | 813    |

The part of this question which is next to be considered is that of the fatal accidents to employés from trains "running off the line." According to Abstracts R and X this cause of accidents has been more fatal to engine-drivers, stokers, and guards, than collisions; but it has been otherwise to the other railway servants and to passengers. It will also be observed that of 45 deaths amongst employés from trains running off the line, no less than 38 are recorded as happening to engine-drivers, stokers, and guards; and this is only what might be expected, as they are more than any other of the employés exposed to this kind of accidents, while porters and other servants are more liable to death and injury from being crushed, as shewn in Abstracts X and Z. The following Table shews the deaths and injuries resulting from trains running off the line, since the year 1844:—



TABLE XXXVIII.

*The Number and Ratio of Deaths and Injuries from Trains running "Off the Line" during the Years 1844-52, among*

| Period.       | Engine Drivers. |           |        | Stokers. |           |        | Guards. |           |        |
|---------------|-----------------|-----------|--------|----------|-----------|--------|---------|-----------|--------|
|               | Number.         | Off Line. |        | Number.  | Off Line. |        | Number. | Off Line. |        |
|               |                 | Killed.   | One in |          | Killed.   | One in |         | Killed.   | One in |
| 1844 to 1847  | 3,658           | 11        | 333    | 3,800    | 4         | 950    | 3,394   | 1         | 3,394  |
| 1848 ... 1851 | 7,910           | 5         | 1,582  | 8,205    | 5         | 1,641  | 7,339   | 2         | 3,670  |
| 1852 . . .    | 2,446           | 3         | 815    | 2,537    | 4         | 634    | 2,269   | 3         | 756    |
| 1844 to 1852  | 14,014          | 19        | 738    | 14,542   | 13        | 1,119  | 13,002  | 6         | 2,167  |

| Period.       | Number. | Injured. | One in | Number. | Injured. | One in | Number. | Injured. | One in |
|---------------|---------|----------|--------|---------|----------|--------|---------|----------|--------|
| 1844 to 1847  | 3,658   | 7        | 523    | 3,800   | 8        | 475    | 3,394   | 6        | 566    |
| 1848 ... 1851 | 7,910   | 9        | 879    | 8,205   | 5        | 1,641  | 7,339   | 2        | 3,670  |
| 1852 . . .    | 2,446   | 5        | 489    | 2,537   | 3        | 846    | 2,269   | 3        | 756    |
| 1844 to 1852  | 14,014  | 21       | 667    | 14,542  | 16       | 909    | 13,002  | 11       | 1,182  |

One of the most startling results appearing in this inquiry will be found in the preceding Table. It will be seen that, whether attention be directed to the number of deaths or to the number of non-fatal injuries, in the year 1852 the ratio for each class was amazingly increased beyond that of the period of years immediately preceding, namely, 1848-51. The very wonderful rate of increase in this class of accidents during the year 1852 is difficult to be understood, and the extraordinary increase in the deaths and injuries of employes is not easily to be accounted for. On referring to Table XXVIII it will be seen that the number of trains or parts of trains which actually ran off the rails in that year, was less than in the preceding period relatively, not only to the extent of railway communication open for traffic, but also to the number of persons employed in the service of the companies; and moreover the deaths and injuries of passengers from trains running off the line during 1852 were greatly below the averages of the years 1848-51. In 1852 not a single passenger was killed from trains running off the line, and not more than 17 were injured,



TABLE XXXIX.

*Shewing the Number of Deaths and Injuries to Railway Employés and to Passengers from Railway Accidents in Great Britain and Ireland, during the period 1st January, 1853, to 31st December, 1856.*

| Number of Accidents . . . . .             | Collisions.       |          |                          |          | Trains getting off the Rails. |          |                          |          | Trains running into Sidings through Points being wrong. |          |                          |          | Axles or Wheels of Engines attached to Trains breaking. |          |                          |          | Couplings breaking. |          |                          |          | Bursting of the Boilers of Engines. |          |                          |          | Running into Station at too high a Speed, &c. |          |                          |          | All Causes. |  |  |  |
|-------------------------------------------|-------------------|----------|--------------------------|----------|-------------------------------|----------|--------------------------|----------|---------------------------------------------------------|----------|--------------------------|----------|---------------------------------------------------------|----------|--------------------------|----------|---------------------|----------|--------------------------|----------|-------------------------------------|----------|--------------------------|----------|-----------------------------------------------|----------|--------------------------|----------|-------------|--|--|--|
|                                           | Passenger Trains. |          | Goods or Mineral Trains. |          | Passenger Trains.             |          | Goods or Mineral Trains. |          | Passenger Trains.                                       |          | Goods or Mineral Trains. |          | Passenger Trains.                                       |          | Goods or Mineral Trains. |          | Passenger Trains.   |          | Goods or Mineral Trains. |          | Passenger Trains.                   |          | Goods or Mineral Trains. |          | Passenger Trains.                             |          | Goods or Mineral Trains. |          |             |  |  |  |
|                                           | Killed.           | Injured. | Killed.                  | Injured. | Killed.                       | Injured. | Killed.                  | Injured. | Killed.                                                 | Injured. | Killed.                  | Injured. | Killed.                                                 | Injured. | Killed.                  | Injured. | Killed.             | Injured. | Killed.                  | Injured. | Killed.                             | Injured. | Killed.                  | Injured. | Killed.                                       | Injured. | Killed.                  | Injured. |             |  |  |  |
| Number of Passengers. . . . .             | 45                | 955      | 1*                       | ...      | 7                             | 104      | ...                      | ...      | 21                                                      | ...      | ...                      | ...      | 9                                                       | ...      | ...                      | ...      | 3                   | 16       | ...                      | ...      | 14                                  | ...      | ...                      | ...      | ...                                           | ...      | ...                      | ...      |             |  |  |  |
|                                           | 22                | 58       | 15                       | 48       | 18                            | 31       | 3                        | 1        | 8                                                       | 15       | ...                      | ...      | 3                                                       | 5        | 2                        | ...      | 1                   | 3        | ...                      | 2        | ...                                 | ...      | ...                      | ...      | ...                                           | ...      | ...                      | ...      |             |  |  |  |
| Number of Servants of Companies . . . . . | 67                | 1013     | 16                       | 48       | 25                            | 135      | 3                        | 1        | 8                                                       | 108      | ...                      | 3        | 14                                                      | 2        | ...                      | 4        | 19                  | ...      | 2                        | ...      | 1                                   | 14       | 2                        | 2        | 2                                             | 2        | 2                        | 2        |             |  |  |  |
| Total Passengers and Servants             | 67                | 1013     | 16                       | 48       | 25                            | 135      | 3                        | 1        | 8                                                       | 108      | ...                      | 3        | 14                                                      | 2        | ...                      | 4        | 19                  | ...      | 2                        | ...      | 1                                   | 14       | 2                        | 2        | 2                                             | 2        | 2                        | 2        |             |  |  |  |

\* In charge of Cattle.

TABLE XL.

*Number of Persons Killed and Injured on all the Railways open for traffic in Great Britain and Ireland, during the period 1st January, 1853, to 31st December, 1856.*

| Year.       | Passengers Killed or Injured from Causes beyond their own control. |          | Passengers Killed or Injured from their own Misconduct or want of Caution. |          | Servants of Companies or of Contractors Killed or Injured from Causes beyond their own control. |          | Servants of Companies or of Contractors Killed or Injured from their own Misconduct or want of Caution. |          | Other Persons Killed or Injured in Crossing at Level Crossings. |          | Trespassers. |          | Miscellaneous. |          | Total.  |          |
|-------------|--------------------------------------------------------------------|----------|----------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------|----------|---------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------|----------|--------------|----------|----------------|----------|---------|----------|
|             | Killed.                                                            | Injured. | Killed.                                                                    | Injured. | Killed.                                                                                         | Injured. | Killed.                                                                                                 | Injured. | Killed.                                                         | Injured. | Killed.      | Injured. | Killed.        | Injured. | Killed. | Injured. |
| Ending 1853 | 36                                                                 | 280      | 28                                                                         | 20       | 62                                                                                              | 89       | 97                                                                                                      | 43       | 31                                                              | 11       | 50           | 6        | 1              | ...      | 305     | 449      |
| 1854        | 12                                                                 | 331      | 19                                                                         | 15       | 39                                                                                              | 56       | 73                                                                                                      | 31       | 38                                                              | 3        | 52           | 17       | ...            | ...      | 223     | 453      |
| 1855        | 10                                                                 | 311      | 18                                                                         | 20       | 28                                                                                              | 41       | 97                                                                                                      | 51       | 35                                                              | 6        | 56           | 14       | 2              | 1        | 246     | 444      |
| 1856        | 8                                                                  | 282      | 19                                                                         | 16       | 30                                                                                              | 46       | 112                                                                                                     | 34       | 28                                                              | 2        | 71           | 7        | 13             | 7        | 281     | 394      |
| Total.....  | 66                                                                 | 1204     | 84                                                                         | 71       | 159                                                                                             | 232      | 379                                                                                                     | 159      | 122                                                             | 22       | 229          | 44       | 16             | 8        | 1055    | 1740     |



TABLE XLI.

Table shewing the Classes of Accidents to Servants of Companies or of Contractors during the period  
1st January, 1855, to 31st December, 1856.

|                                                                                                 | Engine Drivers. |          | Firemen. |          | Guards and Breaksmen. |          | Porters. |          | Policemen. |          | Gatemen and Signalmen. |          | Switchmen. |          | Platelayers. |          | Labourers. |          | Miscellaneous. |          | Total.  |          |
|-------------------------------------------------------------------------------------------------|-----------------|----------|----------|----------|-----------------------|----------|----------|----------|------------|----------|------------------------|----------|------------|----------|--------------|----------|------------|----------|----------------|----------|---------|----------|
|                                                                                                 | Killed.         | Injured. | Killed.  | Injured. | Killed.               | Injured. | Killed.  | Injured. | Killed.    | Injured. | Killed.                | Injured. | Killed.    | Injured. | Killed.      | Injured. | Killed.    | Injured. | Killed.        | Injured. | Killed. | Injured. |
| From Causes beyond their own Control, viz.:—                                                    |                 |          |          |          |                       |          |          |          |            |          |                        |          |            |          |              |          |            |          |                |          |         |          |
| Collisions . . . . .                                                                            | 5               | 7        | 7        | 8        | 4                     | 29       | ...      | ...      | ...        | ...      | ...                    | ...      | ...        | ...      | ...          | 1        | 2          | 4        | 1              | ...      | 19      | 49       |
| Trains or Engines getting off Rails . . . . .                                                   | 4               | 7        | 3        | 9        | 1                     | 5        | ...      | ...      | ...        | ...      | ...                    | ...      | ...        | ...      | ...          | 1        | ...        | ...      | ...            | 3        | 8       | 25       |
| Trains running into Siding or off their proper Line, through Points being wrong . . . . .       | 1               | 3        | 1        | 3        | ...                   | 4        | ...      | ...      | ...        | 1        | ..                     | ...      | ...        | ...      | ...          | ...      | 6          | 1        | ...            | ...      | 8       | 12       |
| Axles or Machinery breaking . . . . .                                                           | 2               | 2        | 4        | 1        | 1                     | 1        | ...      | 1        | ...        | ...      | ...                    | ...      | ...        | ...      | ...          | ...      | ...        | ...      | ...            | 1        | 7       | 6        |
| Run over or crushed between Buffers while coupling or uncoupling Carriages or Waggon . . . . .  | ...             | 1        | ...      | ...      | 2                     | 2        | 1        | ...      | ...        | ...      | ...                    | ...      | ...        | ...      | ...          | ...      | ...        | ...      | 2              | ...      | 5       | 3        |
| Run over while shunting Trains . . . . .                                                        | ...             | ...      | 1        | ...      | ...                   | 2        | 2        | ...      | ...        | 1        | ...                    | ...      | 1          | 1        | ...          | 1        | 1          | ...      | 1              | ...      | 6       | 5        |
| Run over or struck while properly performing other duties . . . . .                             | 1               | 2        | 3        | 2        | 1                     | 1        | 4        | 3        | ...        | ...      | ...                    | ...      | ...        | ...      | 1            | ...      | 4          | 5        | 3              | 2        | 17      | 15       |
| Boiler Explosions . . . . .                                                                     | ...             | 2        | 2        | 1        | ...                   | ...      | ...      | ...      | ...        | ...      | ...                    | ...      | ...        | 1        | ..           | ...      | 1          | ...      | 2              | 4        | 5       | 8        |
| Struck against Bridges . . . . .                                                                | ...             | ...      | 1        | ...      | 1                     | 1        | ...      | ...      | ...        | ...      | ...                    | ...      | ...        | ...      | ...          | ...      | ...        | ...      | 1              | ...      | 3       | 1        |
| TOTAL . . . . .                                                                                 | 13              | 24       | 22       | 24       | 10                    | 45       | 7        | 4        | ...        | 2        | ...                    | ...      | 1          | 2        | 1            | 3        | 14         | 10       | 10             | 10       | 78      | 124      |
| From want of Caution or Misconduct, viz.:—                                                      |                 |          |          |          |                       |          |          |          |            |          |                        |          |            |          |              |          |            |          |                |          |         |          |
| Collisions . . . . .                                                                            | 3               | 2        | 1        | 1        | ...                   | ...      | ...      | ...      | ...        | ...      | ...                    | ...      | ...        | ...      | ...          | ...      | ...        | ...      | ...            | ...      | 4       | 3        |
| Crushed between Buffers, or run over while coupling or uncoupling Carriages or Waggon . . . . . | ...             | 2        | 3        | 2        | 6                     | 7        | 10       | 7        | ...        | ...      | 1                      | 1        | 1          | ...      | ...          | ...      | 1          | ...      | 7              | 2        | 29      | 21       |
| Run over while crossing or standing upon Railway . . . . .                                      | 3               | ...      | 5        | ...      | 5                     | ...      | 11       | 3        | 7          | ...      | 11                     | 1        | 3          | ...      | 16           | 3        | 20         | 3        | 19             | 3        | 100     | 13       |
| Run over while shunting Trains . . . . .                                                        | ...             | ...      | 1        | 1        | 4                     | 3        | 6        | 4        | ...        | ...      | ...                    | ...      | 2          | ...      | 1            | 1        | 1          | 1        | 3              | 1        | 18      | 11       |
| While incautiously working on the Line . . . . .                                                | ...             | ...      | ...      | 2        | ...                   | ...      | 1        | ...      | ...        | ...      | ...                    | ...      | ...        | ...      | 12           | 4        | 11         | 7        | 6              | ...      | 30      | 13       |
| Attempting to get on or off Engines or Carriages in motion . . . . .                            | 1               | 2        | 6        | 3        | 5                     | 4        | 4        | 4        | 3          | 1        | 1                      | 1        | 3          | ...      | 3            | 4        | 4          | ...      | 13             | 3        | 43      | 22       |
| Boiler Explosions . . . . .                                                                     | 1               | ...      | 1        | ...      | ...                   | ...      | ...      | ...      | ...        | ...      | ...                    | ...      | ...        | ...      | ...          | ...      | ...        | ...      | ...            | ...      | 2       | ...      |
| Struck against Bridges . . . . .                                                                | 1               | ...      | 1        | ...      | 3                     | 1        | ...      | ...      | ...        | ...      | ...                    | ...      | ..         | ...      | ...          | ...      | ...        | ...      | ...            | ...      | 5       | 1        |
| Falling from Carriages or Waggon . . . . .                                                      | 1               | ...      | 2        | 2        | 1                     | 5        | 3        | 1        | ...        | ...      | ...                    | ...      | ...        | ...      | 1            | 1        | 5          | 2        | 2              | 1        | 15      | 12       |
| TOTAL . . . . .                                                                                 | 10              | 6        | 20       | 11       | 24                    | 20       | 35       | 19       | 10         | 1        | 13                     | 3        | 9          | ...      | 33           | 13       | 42         | 13       | 50             | 10       | 246     | 96       |
| GRAND TOTAL . . . . .                                                                           | 23              | 30       | 42       | 35       | 34                    | 65       | 42       | 23       | 10         | 3        | 13                     | 3        | 10         | 2        | 34           | 16       | 56         | 23       | 60             | 20       | 324     | 220      |



while in the period preceding 1848-51, the number killed from the same cause was 16, and that injured 96, or 4 per annum killed and 24 injured. It will be found impossible to account for this discrepancy between the deaths and injuries of employés and passengers, on the supposition of an undue proportion of the accidents from trains "running off the line" having happened to goods' and other trains not carrying passengers; for by referring to Table XXX it will be seen that not a single case occurred of a goods' train running off the line in the year 1852, and, consequently, no death or injury is recorded from that cause. Of the 14 recorded instances of "running off the line," given in Table XXX it will be seen that

*None* occurred to goods' trains.

*One* only to engines—resulting in no deaths, but injury to one employé :—and

*Thirteen* occurred to } resulting in no death amongst passengers, but injuring 17 of them: while no less than 10  
passenger trains... } employés were killed, and 11 injured.

Results of so curious and anomalous a nature are certainly very striking, and must enlist the sympathies of every inquirer on behalf of the more important classes of the railway employés, who are thus exposed to so frightful a sacrifice of life and limb while engaged in the discharge of their duties. It is to be lamented that some more effectual means than are yet in use have not been taken to avert the recurrence of such distressing and calamitous accidents; and I trust the efforts now made to bring this analysis prominently before the public may not be altogether devoid of some beneficial influence in directing the attention of those in authority to so vitally important a subject.



## STATISTICS OF CRIME.

---

IN the present paper, an analysis is attempted to be made of the state of Crime in England and Wales, from the returns furnished by the Home Office, for the years 1834-54.

The first point to which attention will be directed, is the influence of age in the production of crime, and its importance as an element in all inquiries concerning the amount and progress of crime, in various districts, and during various periods. In fact, every accurate investigation into the state of crime of a county will be found to involve the consideration of so many important elements of its vital statistics, that the one branch of study necessarily includes the other.

It was necessary to calculate the population for those years; and the formula given in pp. 2-3 *ante*, has been employed for that purpose, both in respect to the whole population of England and Wales, and the different counties and districts hereafter referred to.

The correction pointed out in page 2 as necessary in regard to the unenumerated ages of the population, was also applied to the enumeration of ages in the criminal returns for the respective years.

The preceding corrections having been applied to the numbers given in the Reports of the Census Commissioners, and also to the numbers given in the Home Office Returns of criminals, the following Tables I and II have been produced.

In the second column of each Table will be found the corrected population for England and Wales at the respective ages, for each of the years 1842, 1843, and 1844; and in the third column the total population for those years at each term of life; the fourth column  
[represents



TABLE I.

*Criminal Offenders in England and Wales in 1842, 1843, and 1844, with the Ratio of Crime to the Population at the various Terms of Life calculated to the corrected Population for the respective Periods.—Males.*

| Age.                 |        | Population. |          | Criminals. |       | Ratio of<br>Criminals to total<br>Population. |
|----------------------|--------|-------------|----------|------------|-------|-----------------------------------------------|
| Under 5 . . .        | { 1842 | 1056117     | 3192848  |            |       |                                               |
|                      | { 1843 | 1064261     |          |            |       |                                               |
|                      | { 1844 | 1072470     |          |            |       |                                               |
| 5-10 . . .           | { 1842 | 962144      | 2914110  |            |       |                                               |
|                      | { 1843 | 971341      |          |            |       |                                               |
|                      | { 1844 | 980625      |          |            |       |                                               |
| 10-15 . . .          | { 1842 | 891542      | 2708434  |            |       |                                               |
|                      | { 1843 | 902764      |          |            |       |                                               |
|                      | { 1844 | 914128      |          |            |       |                                               |
| Under 15 . . .       | { 1842 | 2909803     | 8815392  | 1463       | 4351  | ·0494                                         |
|                      | { 1843 | 2938366     |          | 1465       |       |                                               |
|                      | { 1844 | 2967223     |          | 1423       |       |                                               |
| 15-20 . . .          | { 1842 | 793575      | 2416939  | 5755       | 16534 | ·6841                                         |
|                      | { 1843 | 805586      |          | 5633       |       |                                               |
|                      | { 1844 | 817778      |          | 5146       |       |                                               |
| 20-25 . . .          | { 1842 | 739960      | 2344349  | 6531       | 18056 | ·7702                                         |
|                      | { 1843 | 756457      |          | 6145       |       |                                               |
|                      | { 1844 | 847932      |          | 5380       |       |                                               |
| 25-30 . . .          | { 1842 | 624834      | 1841996  | 4008       | 11031 | ·5989                                         |
|                      | { 1843 | 638765      |          | 3750       |       |                                               |
|                      | { 1844 | 578397      |          | 3273       |       |                                               |
| 30-40 . . .          | { 1842 | 1020198     | 3121879  | 4437       | 11843 | ·3794                                         |
|                      | { 1843 | 1040491     |          | 4058       |       |                                               |
|                      | { 1844 | 1061190     |          | 3348       |       |                                               |
| 40-50 . . .          | { 1842 | 761076      | 2319422  | 2117       | 5807  | ·2504                                         |
|                      | { 1843 | 773078      |          | 1935       |       |                                               |
|                      | { 1844 | 785268      |          | 1755       |       |                                               |
| 50-60 . . .          | { 1842 | 503017      | 1527775  | 960        | 2588  | ·1694                                         |
|                      | { 1843 | 509233      |          | 814        |       |                                               |
|                      | { 1844 | 515525      |          | 814        |       |                                               |
| 60 and upwards .     | { 1842 | 539606      | 1636529  | 469        | 1330  | ·0813                                         |
|                      | { 1843 | 545488      |          | 451        |       |                                               |
|                      | { 1844 | 551435      |          | 410        |       |                                               |
| Proportion, 1 in 336 |        |             | 24024281 |            | 71540 | ·2978                                         |



TABLE II.

*Criminal Offenders in England and Wales in 1842, 1843, and 1844, with the Ratio of Crime to the Population at the various Terms of Life calculated to the corrected Population for the respective Periods.—Females.*

| Age.                  |        | Population. |          | Criminals. |         | Ratio of<br>Criminals to total<br>Population. |
|-----------------------|--------|-------------|----------|------------|---------|-----------------------------------------------|
| 5 . . .               | { 1842 | 1068046     | 3232970  |            | 701     | ·0080                                         |
|                       | { 1843 | 1077628     |          |            |         |                                               |
|                       | { 1844 | 1087296     |          |            |         |                                               |
| 5-10 . . .            | { 1842 | 961863      | 2914625  |            | 3716    | ·1495                                         |
|                       | { 1843 | 971510      |          |            |         |                                               |
|                       | { 1844 | 981252      |          |            |         |                                               |
| 10-15 . . .           | { 1842 | 863979      | 2627281  |            | 3763    | ·1459                                         |
|                       | { 1843 | 875707      |          |            |         |                                               |
|                       | { 1844 | 887595      |          |            |         |                                               |
| Under 15 . . .        | { 1842 | 2893888     | 8774876  | 243        | 2391    | ·1141                                         |
|                       | { 1843 | 2924845     |          | 249        |         |                                               |
|                       | { 1844 | 2956143     |          | 209        |         |                                               |
| 15-20 . . .           | { 1842 | 816962      | 2484932  | 1268       | 2672    | ·0817                                         |
|                       | { 1843 | 828259      |          | 1266       |         |                                               |
|                       | { 1844 | 839711      |          | 1182       |         |                                               |
| 20-25 . . .           | { 1842 | 843544      | 2578901  | 1356       | 1548    | ·0643                                         |
|                       | { 1843 | 859533      |          | 1243       |         |                                               |
|                       | { 1844 | 875824      |          | 1164       |         |                                               |
| 25-30 . . .           | { 1842 | 685508      | 2095750  | 869        | 761     | ·0466                                         |
|                       | { 1843 | 698501      |          | 784        |         |                                               |
|                       | { 1844 | 711741      |          | 738        |         |                                               |
| 30-40 . . .           | { 1842 | 1071235     | 3270574  | 944        | 350     | ·0186                                         |
|                       | { 1843 | 1090081     |          | 907        |         |                                               |
|                       | { 1844 | 1109258     |          | 821        |         |                                               |
| 40-50 . . .           | { 1842 | 790308      | 2407733  | 527        | 1633585 |                                               |
|                       | { 1843 | 802515      |          | 525        |         |                                               |
|                       | { 1844 | 814910      |          | 496        |         |                                               |
| 50-60 . . .           | { 1842 | 537073      | 1633585  | 247        |         |                                               |
|                       | { 1843 | 544494      |          | 256        |         |                                               |
|                       | { 1844 | 552018      |          | 258        |         |                                               |
| 60 and upwards .      | { 1842 | 620788      | 1886784  | 115        | 15902   | ·0633                                         |
|                       | { 1843 | 628893      |          | 110        |         |                                               |
|                       | { 1844 | 637103      |          | 125        |         |                                               |
| Proportion, 1 in 1581 |        |             | 25133135 |            |         |                                               |



represents the number of criminal offenders in England and Wales during each of the same three years, and at each term of life; and the fifth column contains the totals for the three years. These lead to the consideration of the sixth column, which shews the ratio per cent. of criminal offenders at each term of life, to the population at the same term of life. An examination of this column will immediately shew its importance and its bearing on Criminal Statistics. The tendency to crime among the male population at various terms of life, will be found in Table I to vary from  $\cdot7702$  per cent. to  $\cdot1694$  per cent.; or, in other words, the tendency to crime at one period of life is more than quadruple that at another. In Table II, similar results will be found for the female population, but with a lower specific and absolute intensity to crime. Over the whole male population of England and Wales, the tendency to crime will be found to be  $\cdot2978$  per cent., but for the female sex it will be found to be  $\cdot0633$  per cent.

One very striking and important feature in Table I is the fact, that more than one-fourth of all the criminal offenders in England and Wales, will be found to be at the quinquennial period of life 20 to 25; and, further, that the number of criminals in the same period exceed those in the succeeding quinquennial period by at least 63 per cent. On a comparison of Tables I and II, it will be found that the tendency to crime in the female population is only 21 per cent. of that in the male population; and if the term of life 20 to 25 be taken, the amount of crime among females will be seen to be only 19 per cent. of that among males; or, in other words, there is five times as much crime in the male population as among an equal number of the female population of the country. Two most important facts thus disclose themselves; first, that the great amount of crime is committed at a given term of life; and second, that while one in every 336 of the male population is yearly guilty of a criminal offence, in the female sex the number is one in every 1581 only.

These facts being established, it will follow that, although in two different districts the tendency to crime in each sex at the respective terms of life may be precisely the same, still, should there be a difference in the distribution of the population over the various periods of life, or a higher proportion of males in the one district than in the other, the usual methods of investigating such questions, in which the element of age is not considered, would lead to the fallacious conclusion, that in the one place there was a greater tendency to crime than in the other. In order more fully to establish this point, the following Tables, III and IV, have been prepared, containing the male and female population in England and Wales, for the respective terms of life recognised in the Home Office Returns for criminal offenders. These numbers are collected and arranged from the census returns for 1841; and in Table V the same facts in relation to the male sex will be found set forth in a different form, with an additional column, representing the ratio per cent. of the population at each term of life to the whole population of the male sex in every county.



TABLE III.

*Population.—England and Wales.—1841.—Males.*

| COUNTIES.                | Aged under<br>15 Years. | Aged 15 Years<br>and under 20. | Aged 20 Years<br>and under 25. | Aged 25 Years<br>and under 30. | Aged 30 Years<br>and under 40. | Aged 40 Years<br>and under 50. | Aged 50 Years<br>and under 60. | Aged 60 Years<br>and above. | Total. |
|--------------------------|-------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------------|--------|
| Bedford . . . . .        | 20684                   | 5286                           | 4584                           | 3713                           | 6270                           | 4819                           | 3065                           | 3710                        | 52131  |
| Berks . . . . .          | 29361                   | 7853                           | 7184                           | 5886                           | 9934                           | 7694                           | 5343                           | 6341                        | 79596  |
| Bucks . . . . .          | 29242                   | 7790                           | 6449                           | 5430                           | 8912                           | 7207                           | 5018                           | 6179                        | 76227  |
| Cambridge . . . . .      | 31194                   | 8203                           | 7887                           | 6116                           | 9839                           | 7786                           | 4910                           | 5396                        | 81331  |
| Cheshire . . . . .       | 73390                   | 20302                          | 18470                          | 15309                          | 24738                          | 17617                          | 11494                          | 11206                       | 192526 |
| Cornwall . . . . .       | 67108                   | 17517                          | 13770                          | 11158                          | 18605                          | 14761                          | 10066                          | 11310                       | 164295 |
| Cumberland . . . . .     | 32256                   | 8855                           | 7792                           | 6247                           | 10195                          | 8112                           | 5948                           | 6513                        | 85918  |
| Derby . . . . .          | 50695                   | 13755                          | 12026                          | 10484                          | 17095                          | 12719                          | 8769                           | 9680                        | 135223 |
| Devon . . . . .          | 95058                   | 25727                          | 21277                          | 17604                          | 29491                          | 23864                          | 18206                          | 20822                       | 252049 |
| Dorset . . . . .         | 32656                   | 8206                           | 6670                           | 5722                           | 9749                           | 7760                           | 5559                           | 7137                        | 83459  |
| Durham . . . . .         | 61202                   | 16430                          | 15837                          | 13244                          | 20345                          | 13881                          | 9086                           | 9677                        | 159702 |
| Essex . . . . .          | 64617                   | 16647                          | 15362                          | 12722                          | 20708                          | 17107                          | 11304                          | 12843                       | 171310 |
| Gloucester . . . . .     | 75469                   | 20142                          | 18346                          | 15441                          | 25916                          | 20285                          | 13432                          | 15299                       | 204330 |
| Hereford . . . . .       | 19586                   | 5502                           | 4782                           | 4169                           | 7125                           | 5956                           | 4270                           | 5476                        | 56866  |
| Hertford . . . . .       | 29630                   | 7814                           | 6853                           | 5634                           | 9395                           | 7255                           | 4970                           | 5569                        | 77120  |
| Huntingdon . . . . .     | 11075                   | 3005                           | 2693                           | 2163                           | 3352                           | 2756                           | 1802                           | 2099                        | 28945  |
| Kent . . . . .           | 98569                   | 26710                          | 25731                          | 19715                          | 33474                          | 25299                          | 18058                          | 21928                       | 269484 |
| Lancaster . . . . .      | 303779                  | 85122                          | 81057                          | 69472                          | 113866                         | 75441                          | 44921                          | 39419                       | 813077 |
| Leicester . . . . .      | 39389                   | 10749                          | 9061                           | 7603                           | 12812                          | 10379                          | 7050                           | 8434                        | 105477 |
| Lincoln . . . . .        | 66780                   | 18202                          | 16813                          | 13744                          | 21936                          | 17494                          | 11674                          | 13823                       | 180466 |
| Middlesex . . . . .      | 237999                  | 66724                          | 75832                          | 69575                          | 113609                         | 82375                          | 48145                          | 39286                       | 733545 |
| Monmouth . . . . .       | 23931                   | 6810                           | 7903                           | 6702                           | 10008                          | 6709                           | 4166                           | 4238                        | 70467  |
| Norfolk . . . . .        | 47832                   | 20150                          | 16554                          | 13608                          | 23375                          | 20071                          | 13122                          | 17060                       | 198772 |
| Northampton . . . . .    | 36439                   | 10169                          | 9008                           | 7197                           | 12112                          | 9495                           | 6465                           | 7777                        | 98662  |
| Northumberland . . . . . | 44474                   | 12234                          | 11668                          | 9746                           | 15458                          | 11144                          | 7803                           | 8345                        | 120872 |
| Nottingham . . . . .     | 45795                   | 11811                          | 10216                          | 8789                           | 15554                          | 11957                          | 8112                           | 9147                        | 121381 |



TABLE III.—(continued.)  
Population.—England and Wales.—1841.—Males.

| COUNTIES.              | Aged under<br>15 Years. | Aged 15 Years<br>and under 20. | Aged 20 Years<br>and under 25. | Aged 25 Years<br>and under 30. | Aged 30 Years<br>and under 40. | Aged 40 Years<br>and under 50. | Aged 50 Years<br>and under 60. | Aged 60 Years<br>and above. | Total. |
|------------------------|-------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------------|--------|
| Oxford . . . . .       | 29853                   | 8092                           | 7453                           | 5699                           | 9604                           | 7609                           | 5326                           | 6540                        | 80176  |
| Rutland . . . . .      | 3961                    | 1110                           | 895                            | 708                            | 1283                           | 1030                           | 716                            | 956                         | 10659  |
| Salop . . . . .        | 43315                   | 12330                          | 10586                          | 9002                           | 14844                          | 11462                          | 7965                           | 9533                        | 119037 |
| Somerset . . . . .     | 77906                   | 21562                          | 18398                          | 15093                          | 24974                          | 20341                          | 13978                          | 16666                       | 208918 |
| Southampton . . . . .  | 63786                   | 17329                          | 16244                          | 13192                          | 20873                          | 16442                          | 12534                          | 13944                       | 174344 |
| Stafford . . . . .     | 98920                   | 26193                          | 24633                          | 21616                          | 33266                          | 23298                          | 14908                          | 14752                       | 257586 |
| Suffolk . . . . .      | 58982                   | 15555                          | 12962                          | 10598                          | 17961                          | 14505                          | 10166                          | 13103                       | 153832 |
| Surrey . . . . .       | 98513                   | 25057                          | 25399                          | 22971                          | 39077                          | 29010                          | 18094                          | 17086                       | 275207 |
| Sussex . . . . .       | 56936                   | 13991                          | 12475                          | 10385                          | 17907                          | 14022                          | 9625                           | 11211                       | 146552 |
| Warwick . . . . .      | 71682                   | 19198                          | 18491                          | 16010                          | 25729                          | 19220                          | 12035                          | 12417                       | 194782 |
| Westmoreland . . . . . | 10219                   | 3023                           | 2526                           | 1972                           | 3268                           | 2619                           | 1972                           | 2475                        | 28074  |
| Wilts . . . . .        | 48088                   | 13282                          | 11435                          | 8842                           | 14777                          | 12234                          | 8272                           | 10524                       | 127454 |
| Worcester . . . . .    | 42754                   | 10927                          | 10073                          | 8628                           | 14581                          | 11264                          | 7378                           | 8644                        | 114249 |
| York . . . . .         | 297615                  | 82535                          | 74064                          | 61876                          | 97820                          | 72260                          | 49010                          | 50229                       | 785409 |
| Anglesea . . . . .     | 9586                    | 2366                           | 1902                           | 1605                           | 2613                           | 2275                           | 1781                           | 2165                        | 24293  |
| Brecon . . . . .       | 9604                    | 2844                           | 2775                           | 2362                           | 3722                           | 2572                           | 1897                           | 2247                        | 28023  |
| Cardigan . . . . .     | 12811                   | 3333                           | 2639                           | 2212                           | 3589                           | 2762                           | 2200                           | 2637                        | 32183  |
| Carmarthen . . . . .   | 20524                   | 5196                           | 4009                           | 3411                           | 5859                           | 4215                           | 3274                           | 4079                        | 50567  |
| Carnarvon . . . . .    | 14931                   | 3939                           | 3497                           | 3135                           | 4880                           | 3474                           | 2646                           | 2935                        | 39437  |
| Denbigh . . . . .      | 16535                   | 4691                           | 3842                           | 3166                           | 5307                           | 4119                           | 3131                           | 3582                        | 44373  |
| Flint . . . . .        | 12746                   | 3599                           | 3077                           | 2507                           | 4090                           | 3084                           | 2130                           | 2223                        | 33456  |
| Glamorgan . . . . .    | 31177                   | 8797                           | 9476                           | 8006                           | 12406                          | 7720                           | 4810                           | 5022                        | 87414  |
| Merioneth . . . . .    | 7027                    | 1817                           | 1611                           | 1515                           | 2342                           | 1697                           | 1436                           | 1817                        | 19262  |
| Montgomery . . . . .   | 12932                   | 3547                           | 2850                           | 2359                           | 3948                           | 3089                           | 2579                           | 2941                        | 34245  |
| Pembroke . . . . .     | 16175                   | 4067                           | 3160                           | 2592                           | 4485                           | 3615                           | 2649                           | 3376                        | 40119  |
| Radnor . . . . .       | 4731                    | 1305                           | 1217                           | 914                            | 1359                           | 1188                           | 937                            | 1153                        | 12804  |



TABLE IV.

*Population—England and Wales.—1841.—Females.*

| COUNTIES.                | Aged under<br>15 Years. | Aged 15 Years<br>and under 20. | Aged 20 Years<br>and under 25. | Aged 25 Years<br>and under 30. | Aged 30 Years<br>and under 40. | Aged 40 Years<br>and under 50. | Aged 50 Years<br>and under 60. | Aged 60 Years<br>and above. | Total. |
|--------------------------|-------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------------|--------|
| Bedford . . . . .        | 20213                   | 5763                           | 5738                           | 4344                           | 6804                           | 5293                           | 3461                           | 4118                        | 55734  |
| Berks . . . . .          | 28708                   | 7773                           | 7686                           | 6407                           | 9957                           | 7698                           | 5494                           | 6868                        | 80591  |
| Bucks . . . . .          | 28614                   | 7723                           | 7415                           | 6180                           | 9639                           | 7726                           | 5419                           | 6652                        | 79368  |
| Cambridge . . . . .      | 31091                   | 8128                           | 8522                           | 6473                           | 9833                           | 7612                           | 4957                           | 6144                        | 82760  |
| Chester . . . . .        | 73263                   | 21886                          | 21384                          | 16815                          | 25672                          | 18189                          | 12239                          | 12250                       | 201698 |
| Cornwall . . . . .       | 65226                   | 17477                          | 16657                          | 13008                          | 20720                          | 16508                          | 11995                          | 14880                       | 176471 |
| Cumberland . . . . .     | 31696                   | 9342                           | 8912                           | 7107                           | 11052                          | 8696                           | 6582                           | 8138                        | 91525  |
| Derby . . . . .          | 50625                   | 13800                          | 12935                          | 10735                          | 17009                          | 12687                          | 8847                           | 9775                        | 136413 |
| Devon . . . . .          | 94527                   | 27246                          | 27754                          | 22330                          | 34347                          | 27473                          | 21021                          | 25877                       | 280575 |
| Dorset . . . . .         | 32579                   | 8701                           | 8792                           | 6922                           | 11165                          | 8752                           | 6282                           | 8239                        | 91432  |
| Durham . . . . .         | 60304                   | 16184                          | 16395                          | 13334                          | 21073                          | 14553                          | 10270                          | 11955                       | 164068 |
| Essex . . . . .          | 64564                   | 16512                          | 16474                          | 13105                          | 20492                          | 16536                          | 11179                          | 13317                       | 172179 |
| Gloucester . . . . .     | 75917                   | 22460                          | 23463                          | 18588                          | 29043                          | 22445                          | 15048                          | 18710                       | 225674 |
| Hereford . . . . .       | 19436                   | 5375                           | 5122                           | 4227                           | 6916                           | 5533                           | 4267                           | 5962                        | 56838  |
| Hertford . . . . .       | 28854                   | 7661                           | 7811                           | 6254                           | 9948                           | 7671                           | 5210                           | 6029                        | 79448  |
| Huntingdon . . . . .     | 11041                   | 2950                           | 2928                           | 2205                           | 3402                           | 2744                           | 1854                           | 2288                        | 29412  |
| Kent . . . . .           | 96865                   | 26192                          | 27703                          | 22597                          | 35197                          | 26315                          | 18346                          | 21285                       | 274500 |
| Lancaster . . . . .      | 304112                  | 89897                          | 93520                          | 75845                          | 117577                         | 77117                          | 48360                          | 45201                       | 851629 |
| Leicester . . . . .      | 39656                   | 11009                          | 10730                          | 8652                           | 13716                          | 10689                          | 7228                           | 8532                        | 110212 |
| Lincoln . . . . .        | 66177                   | 17848                          | 17649                          | 13924                          | 21539                          | 16831                          | 11716                          | 14797                       | 180481 |
| Middlesex . . . . .      | 243998                  | 78046                          | 98080                          | 84472                          | 132187                         | 90821                          | 54890                          | 54009                       | 836503 |
| Monmouth . . . . .       | 23347                   | 6126                           | 6806                           | 5449                           | 8324                           | 5575                           | 3709                           | 4344                        | 63680  |
| Norfolk . . . . .        | 74956                   | 21011                          | 20900                          | 16089                          | 25364                          | 20812                          | 14266                          | 20109                       | 213507 |
| Northampton . . . . .    | 36280                   | 9715                           | 9458                           | 7595                           | 12185                          | 9591                           | 6811                           | 8482                        | 100117 |
| Northumberland . . . . . | 44002                   | 12952                          | 13306                          | 10832                          | 16567                          | 11978                          | 8744                           | 10385                       | 128766 |
| Nottingham . . . . .     | 46253                   | 12783                          | 12154                          | 10157                          | 16639                          | 12409                          | 8272                           | 9479                        | 128146 |



TABLE IV.—(continued.)  
Population.—England and Wales.—1841.—Females.

|              | Aged under<br>15 Years. | Aged 15 Years<br>and under 20. | Aged 20 Years<br>and under 25. | Aged 25 Years<br>and under 30. | Aged 30 Years<br>and under 40. | Aged 40 Years<br>and under 50. | Aged 50 Years<br>and under 60. | Aged 60 Years<br>and above. | Total. |
|--------------|-------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|-----------------------------|--------|
| Oxford.      | 29635                   | 8090                           | 7531                           | 6068                           | 9829                           | 7671                           | 5296                           | 6963                        | 81083  |
| Rutland      | 3885                    | 938                            | 895                            | 778                            | 1261                           | 1045                           | 692                            | 1047                        | 10541  |
| Salop        | 43011                   | 11613                          | 11167                          | 9190                           | 14497                          | 11255                          | 8122                           | 10711                       | 119566 |
| Somerset     | 77487                   | 22278                          | 22587                          | 17582                          | 27839                          | 22048                          | 16137                          | 20503                       | 226461 |
| Southampton  | 62711                   | 17536                          | 18213                          | 14562                          | 22392                          | 17419                          | 12586                          | 14382                       | 179801 |
| Stafford     | 98718                   | 24068                          | 24567                          | 20208                          | 30930                          | 22156                          | 14721                          | 15864                       | 251232 |
| Suffolk      | 58552                   | 15693                          | 15496                          | 12086                          | 18816                          | 15010                          | 10681                          | 14527                       | 160861 |
| Surrey       | 98768                   | 27616                          | 32363                          | 27581                          | 44380                          | 31700                          | 19810                          | 22436                       | 303654 |
| Sussex       | 56579                   | 14641                          | 14756                          | 11986                          | 18881                          | 14319                          | 9674                           | 10841                       | 151677 |
| Warwick      | 72544                   | 20387                          | 21488                          | 17616                          | 26855                          | 19712                          | 12615                          | 14464                       | 205681 |
| Westmoreland | 10296                   | 2749                           | 2428                           | 2097                           | 3262                           | 2570                           | 2018                           | 2689                        | 28109  |
| Wilts        | 47500                   | 12694                          | 12165                          | 9225                           | 15220                          | 12660                          | 8984                           | 11953                       | 130401 |
| Worcester    | 42891                   | 11687                          | 11358                          | 9264                           | 14892                          | 11453                          | 7482                           | 9479                        | 118506 |
| York         | 296369                  | 82937                          | 79526                          | 63861                          | 99462                          | 73056                          | 50662                          | 55387                       | 801260 |
| Anglesea     | 9153                    | 2585                           | 2324                           | 1948                           | 3039                           | 2543                           | 2128                           | 2792                        | 26512  |
| Brecon       | 9664                    | 2788                           | 2671                           | 2202                           | 3267                           | 2405                           | 1897                           | 2596                        | 27490  |
| Cardigan     | 12623                   | 3697                           | 3358                           | 2858                           | 4370                           | 3308                           | 2828                           | 3500                        | 36542  |
| Carmarthen   | 20016                   | 5766                           | 5023                           | 4073                           | 6562                           | 4877                           | 3814                           | 5512                        | 55643  |
| Carnarvon    | 14775                   | 4129                           | 3805                           | 3143                           | 4988                           | 3708                           | 2973                           | 3729                        | 41450  |
| Denbigh      | 15901                   | 4561                           | 3942                           | 3202                           | 5168                           | 4116                           | 3216                           | 4311                        | 44417  |
| Flint        | 12405                   | 3162                           | 2932                           | 2401                           | 3913                           | 3163                           | 2254                           | 2836                        | 33066  |
| Glamorgan    | 30554                   | 8184                           | 8359                           | 7034                           | 10684                          | 7219                           | 4958                           | 6262                        | 83254  |
| Merioneth    | 6798                    | 1818                           | 1724                           | 1524                           | 2319                           | 1876                           | 1615                           | 2365                        | 20039  |
| Montgomery   | 12973                   | 3554                           | 2921                           | 2388                           | 3910                           | 3102                           | 2614                           | 3456                        | 34918  |
| Pembroke     | 16403                   | 4910                           | 4667                           | 3599                           | 5596                           | 4469                           | 3374                           | 4760                        | 47778  |
| Radnor.      | 4712                    | 1314                           | 1102                           | 854                            | 1323                           | 1090                           | 910                            | 1211                        | 12516  |



TABLE V.

*Population of England and Wales.—1841.—With the Proportionate Numbers at each Term of Life.—Males.*

| Age.           | BEDFORD.    |                                  | BERKS.      |                                  | BUCKS.      |                                  | CAMBRIDGE.  |                                  |
|----------------|-------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|
|                | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . .   | 20684       | 39.677                           | 29361       | 36.887                           | 29242       | 38.362                           | 31194       | 38.354                           |
| 15...20 . .    | 5286        | 10.139                           | 7853        | 9.866                            | 7790        | 10.219                           | 8203        | 10.086                           |
| 20...25 . .    | 4584        | 8.793                            | 7184        | 9.026                            | 6449        | 8.460                            | 7887        | 9.697                            |
| 25...30 . .    | 3713        | 7.122                            | 5886        | 7.395                            | 5430        | 7.123                            | 6116        | 7.520                            |
| 30...40 . .    | 6270        | 12.027                           | 9934        | 12.483                           | 8912        | 11.691                           | 9839        | 12.098                           |
| 40...50 . .    | 4819        | 9.224                            | 7694        | 9.666                            | 7207        | 9.455                            | 7786        | 9.573                            |
| 50...60 . .    | 3065        | 5.879                            | 5343        | 6.713                            | 5018        | 6.583                            | 4910        | 6.037                            |
| 60 & upwards . | 3710        | 7.116                            | 6341        | 7.967                            | 6179        | 8.106                            | 5396        | 6.635                            |
| Total. . .     | 52131       |                                  | 79596       |                                  | 76227       |                                  | 81331       |                                  |
| Ages unknown   | 59          |                                  | 635         |                                  | 255         |                                  | 280         |                                  |
| Grand Total .  | 52190       |                                  | 80231       |                                  | 76482       |                                  | 81611       |                                  |
|                | CHESHIRE.   |                                  | CORNWALL.   |                                  | CUMBERLAND. |                                  | DERBY.      |                                  |
|                | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . .   | 73390       | 38.119                           | 67108       | 40.846                           | 32256       | 37.543                           | 50695       | 37.576                           |
| 15...20 . .    | 20302       | 10.545                           | 17517       | 10.662                           | 8855        | 10.306                           | 13755       | 10.195                           |
| 20...25 . .    | 18470       | 9.594                            | 13770       | 8.381                            | 7792        | 9.069                            | 12026       | 8.914                            |
| 25...30 . .    | 15309       | 7.952                            | 11158       | 6.791                            | 6247        | 7.271                            | 10484       | 7.771                            |
| 30...40 . .    | 24738       | 12.849                           | 18605       | 11.324                           | 10195       | 11.866                           | 17095       | 12.671                           |
| 40...50 . .    | 17617       | 9.150                            | 14761       | 8.984                            | 8112        | 9.442                            | 12719       | 9.428                            |
| 50...60 . .    | 11494       | 5.970                            | 10066       | 6.127                            | 5948        | 6.916                            | 8769        | 6.500                            |
| 60 & upwards . | 11206       | 5.821                            | 11310       | 6.884                            | 6513        | 7.581                            | 9680        | 7.175                            |
| Total. . .     | 192526      |                                  | 164295      |                                  | 85918       |                                  | 135223      |                                  |
| Ages unknown   | 1120        |                                  | 462         |                                  | 374         |                                  | 397         |                                  |
| Grand Total .  | 193646      |                                  | 164757      |                                  | 86292       |                                  | 135620      |                                  |
|                | DEVON.      |                                  | DORSET.     |                                  | DURHAM.     |                                  | ESSEX.      |                                  |
|                | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . .   | 95058       | 37.714                           | 32656       | 39.128                           | 61202       | 38.323                           | 64617       | 37.719                           |
| 15...20 . .    | 25727       | 10.207                           | 8206        | 9.832                            | 16430       | 10.288                           | 16647       | 9.718                            |
| 20...25 . .    | 21277       | 8.442                            | 6670        | 7.992                            | 15837       | 9.917                            | 15362       | 8.967                            |
| 25...30 . .    | 17604       | 6.984                            | 5722        | 6.856                            | 13244       | 2.293                            | 12722       | 7.426                            |
| 30...40 . .    | 29491       | 11.700                           | 9749        | 11.681                           | 20345       | 12.739                           | 20708       | 12.088                           |
| 40...50 . .    | 23864       | 9.468                            | 7760        | 9.298                            | 13881       | 8.692                            | 17107       | 9.986                            |
| 50...60 . .    | 18206       | 7.223                            | 5559        | 6.661                            | 9086        | 5.689                            | 11304       | 6.599                            |
| 60 & upwards . | 20822       | 8.261                            | 7137        | 8.552                            | 9677        | 6.059                            | 12843       | 7.497                            |
| Total. . .     | 252049      |                                  | 83459       |                                  | 159702      |                                  | 171310      |                                  |
| Ages unknown   | 711         |                                  | 95          |                                  | 371         |                                  | 1038        |                                  |
| Grand Total .  | 252760      |                                  | 83554       |                                  | 160073      |                                  | 172348      |                                  |



TABLE V.—(continued.)

*Population of England and Wales.—1841.—Males.*

| Age.           | GLOUCESTER. |                                  | HEREFORD.   |                                  | HERTFORD.   |                                  | HUNTINGDON.  |                                  |
|----------------|-------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|--------------|----------------------------------|
|                | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population.  | Per centage to the total living. |
| Under 15 . .   | 75469       | 36.935                           | 19586       | 34.442                           | 29630       | 38.421                           | 11075        | 38.262                           |
| 15...20 . .    | 20142       | 9.858                            | 5502        | 9.675                            | 7814        | 10.132                           | 3005         | 10.382                           |
| 20...25 . .    | 18346       | 8.979                            | 4782        | 8.409                            | 6853        | 8.886                            | 2693         | 9.304                            |
| 25...30 . .    | 15441       | 7.557                            | 4169        | 7.331                            | 5634        | 7.306                            | 2163         | 7.473                            |
| 30...40 . .    | 25916       | 12.683                           | 7125        | 12.529                           | 9395        | 12.182                           | 3352         | 11.581                           |
| 40...50 . .    | 20285       | 9.928                            | 5956        | 10.474                           | 7255        | 9.407                            | 2756         | 9.522                            |
| 50...60 . .    | 13432       | 6.574                            | 4270        | 7.509                            | 4970        | 6.444                            | 1802         | 6.226                            |
| 60 & upwards . | 15299       | 7.487                            | 5476        | 9.630                            | 5569        | 7.221                            | 2099         | 7.252                            |
| Total . . .    | 204330      |                                  | 56866       |                                  | 77120       |                                  | 28945        |                                  |
| Ages unknown   | 1213        |                                  | 112         |                                  | 497         |                                  | 127          |                                  |
| Grand Total .  | 205543      |                                  | 56987       |                                  | 77617       |                                  | 29072        |                                  |
|                | KENT.       |                                  | LANCASTER.  |                                  | LEICESTER.  |                                  | LINCOLN.     |                                  |
|                | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population.  | Per centage to the total living. |
| Under 15 . .   | 98569       | 36.577                           | 303779      | 37.362                           | 39389       | 37.343                           | 66780        | 37.004                           |
| 15...20 . .    | 26710       | 9.912                            | 85122       | 10.469                           | 10749       | 10.191                           | 18202        | 10.086                           |
| 20...25 . .    | 25731       | 9.548                            | 81057       | 9.969                            | 9061        | 8.591                            | 16813        | 9.316                            |
| 25...30 . .    | 19715       | 7.316                            | 69472       | 8.544                            | 7603        | 7.208                            | 13744        | 7.616                            |
| 30...40 . .    | 33474       | 12.421                           | 113866      | 14.004                           | 12812       | 12.147                           | 21936        | 12.155                           |
| 40...50 . .    | 25299       | 9.388                            | 75441       | 9.279                            | 10379       | 9.840                            | 17494        | 9.694                            |
| 50...60 . .    | 18058       | 6.701                            | 44921       | 5.525                            | 7050        | 6.684                            | 11674        | 6.469                            |
| 60 & upwards . | 21928       | 8.137                            | 39419       | 4.848                            | 8434        | 7.996                            | 13823        | 7.660                            |
| Total . . .    | 269484      |                                  | 813007      |                                  | 105477      |                                  | 180466       |                                  |
| Ages unknown   | 3048        |                                  | 1770        |                                  | 139         |                                  | 1292         |                                  |
| Grand Total .  | 272532      |                                  | 814847      |                                  | 105616      |                                  | 181758       |                                  |
|                | MIDDLESEX.  |                                  | MONMOUTH.   |                                  | NORFOLK.    |                                  | NORTHAMPTON. |                                  |
|                | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population.  | Per centage to the total living. |
| Under 15 . .   | 237999      | 32.445                           | 23931       | 33.961                           | 74832       | 37.647                           | 36439        | 36.934                           |
| 15...20 . .    | 66724       | 9.096                            | 6810        | 9.664                            | 20150       | 10.137                           | 10169        | 10.307                           |
| 20...25 . .    | 75832       | 10.338                           | 7903        | 11.215                           | 16554       | 8.328                            | 9008         | 9.130                            |
| 25...30 . .    | 69575       | 9.485                            | 6702        | 9.511                            | 13608       | 6.846                            | 7197         | 7.295                            |
| 30...40 . .    | 113609      | 15.487                           | 10008       | 14.202                           | 23375       | 11.760                           | 12112        | 12.276                           |
| 40...50 . .    | 82375       | 11.230                           | 6709        | 9.521                            | 20071       | 10.097                           | 9495         | 9.624                            |
| 50...60 . .    | 48145       | 6.563                            | 4166        | 5.912                            | 13122       | 6.602                            | 6465         | 6.553                            |
| 60 & upwards . | 39286       | 5.356                            | 4238        | 6.014                            | 17060       | 8.583                            | 7777         | 7.883                            |
| Total . . .    | 733545      |                                  | 70467       |                                  | 198772      |                                  | 98662        |                                  |
| Ages unknown   | 5359        |                                  | 139         |                                  | 329         |                                  | 315          |                                  |
| Grand Total .  | 738904      |                                  | 70606       |                                  | 199101      |                                  | 98977        |                                  |



TABLE V.—(continued.)

*Population of England and Wales.—1841.—Males.*

| Age.           | NORTHUMBERLAND. |                                  | NOTTINGHAM. |                                  | OXFORD.      |                                  | RUTLAND.    |                                  |
|----------------|-----------------|----------------------------------|-------------|----------------------------------|--------------|----------------------------------|-------------|----------------------------------|
|                | Population.     | Per centage to the total living. | Population. | Per centage to the total living. | Population.  | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . .   | 44474           | 36.795                           | 45795       | 37.728                           | 29853        | 37.234                           | 3961        | 37.161                           |
| 15...20 . .    | 12234           | 10.122                           | 11811       | 9.731                            | 8092         | 10.093                           | 1110        | 10.414                           |
| 20...25 . .    | 11668           | 9.653                            | 10216       | 8.417                            | 7453         | 9.296                            | 895         | 8.397                            |
| 25...30 . .    | 9746            | 8.063                            | 8789        | 7.241                            | 5699         | 7.108                            | 708         | 6.642                            |
| 30...40 . .    | 15458           | 12.789                           | 15554       | 12.814                           | 9604         | 11.979                           | 1283        | 12.036                           |
| 40...50 . .    | 11144           | 9.220                            | 11957       | 9.851                            | 7609         | 9.499                            | 1030        | 9.663                            |
| 50...60 . .    | 7803            | 6.456                            | 8112        | 6.683                            | 5326         | 6.643                            | 716         | 6.717                            |
| 60 & upwards . | 8345            | 6.904                            | 9147        | 7.536                            | 6540         | 8.157                            | 956         | 8.969                            |
| Total . .      | 120872          |                                  | 121381      |                                  | 80176        |                                  | 10659       |                                  |
| Ages unknown   | 396             |                                  | 350         |                                  | 260          |                                  | 62          |                                  |
| Grand Total .  | 121268          |                                  | 121731      |                                  | 80436        |                                  | 10721       |                                  |
|                | SALOP.          |                                  | SOMERSET.   |                                  | SOUTHAMPTON. |                                  | STAFFORD.   |                                  |
|                | Population.     | Per centage to the total living. | Population. | Per centage to the total living. | Population.  | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . .   | 43315           | 36.388                           | 77906       | 37.290                           | 63786        | 36.586                           | 98920       | 38.403                           |
| 15...20 . .    | 12330           | 10.599                           | 21562       | 10.321                           | 17329        | 9.940                            | 26193       | 10.169                           |
| 20...25 . .    | 10586           | 8.893                            | 18398       | 8.806                            | 16244        | 9.317                            | 24633       | 9.563                            |
| 25...30 . .    | 9002            | 7.562                            | 15093       | 7.224                            | 13192        | 7.567                            | 21616       | 8.392                            |
| 30...40 . .    | 14844           | 12.470                           | 24974       | 11.954                           | 20873        | 11.972                           | 33266       | 12.915                           |
| 40...50 . .    | 11462           | 9.629                            | 20341       | 9.736                            | 16442        | 9.431                            | 23298       | 9.045                            |
| 50...60 . .    | 7965            | 6.691                            | 13978       | 6.691                            | 12534        | 7.189                            | 14908       | 5.788                            |
| 60 & upwards . | 9533            | 8.008                            | 16666       | 7.977                            | 13944        | 7.998                            | 14752       | 5.727                            |
| Total . .      | 119037          |                                  | 208918      |                                  | 174344       |                                  | 257586      |                                  |
| Ages unknown   | 318             |                                  | 465         |                                  | 679          |                                  | 1278        |                                  |
| Grand Total .  | 119355          |                                  | 209383      |                                  | 175023       |                                  | 258864      |                                  |
|                | SUFFOLK.        |                                  | SURREY.     |                                  | SUSSEX.      |                                  | WARWICK.    |                                  |
|                | Population.     | Per centage to the total living. | Population. | Per centage to the total living. | Population.  | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . .   | 58982           | 38.342                           | 98513       | 35.796                           | 56936        | 38.850                           | 71682       | 36.801                           |
| 15...20 . .    | 15555           | 10.112                           | 25057       | 9.105                            | 13991        | 9.547                            | 19198       | 9.856                            |
| 20...25 . .    | 12962           | 8.426                            | 25399       | 9.229                            | 12475        | 8.512                            | 18491       | 9.493                            |
| 25...30 . .    | 10598           | 6.874                            | 22971       | 8.347                            | 10385        | 7.086                            | 16010       | 8.220                            |
| 30...40 . .    | 17961           | 11.703                           | 39077       | 14.199                           | 17907        | 12.191                           | 25729       | 13.209                           |
| 40...50 . .    | 14505           | 9.429                            | 29010       | 10.541                           | 14022        | 9.568                            | 19220       | 9.867                            |
| 50...60 . .    | 10166           | 6.609                            | 18094       | 6.575                            | 9625         | 6.568                            | 12035       | 6.178                            |
| 60 & upwards . | 13103           | 8.518                            | 17086       | 6.208                            | 11211        | 7.650                            | 12417       | 6.375                            |
| Total . .      | 153832          |                                  | 275207      |                                  | 146552       |                                  | 194782      |                                  |
| Ages unknown   | 263             |                                  | 2996        |                                  | 1052         |                                  | 897         |                                  |
| Grand Total .  | 154095          |                                  | 278203      |                                  | 147604       |                                  | 195679      |                                  |



TABLE V.—(continued.)

*Population of England and Wales.—1841.—Males.*

| Age.            | WESTMORELAND. |                                  | WILTS.      |                                  | WORCESTER.  |                                  | YORK.       |                                  |
|-----------------|---------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|
|                 | Population.   | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . . .  | 10219         | 36.400                           | 48088       | 37.730                           | 42754       | 37.422                           | 297615      | 37.893                           |
| 15 ... 20 . . . | 3023          | 10.768                           | 13282       | 10.421                           | 10927       | 9.564                            | 82535       | 10.509                           |
| 20 ... 25 . . . | 2526          | 8.998                            | 11435       | 8.972                            | 10073       | 8.817                            | 74064       | 9.430                            |
| 25 ... 30 . . . | 1972          | 7.024                            | 8842        | 6.937                            | 8628        | 7.552                            | 61876       | 7.878                            |
| 30 ... 40 . . . | 3268          | 11.641                           | 14777       | 11.594                           | 14581       | 12.762                           | 97820       | 12.456                           |
| 40 ... 50 . . . | 2619          | 9.329                            | 12234       | 9.599                            | 11264       | 9.859                            | 72260       | 9.200                            |
| 50 ... 60 . . . | 1972          | 7.024                            | 8272        | 6.490                            | 7378        | 6.458                            | 49010       | 6.240                            |
| 60 & upwards .  | 2475          | 8.816                            | 10524       | 8.257                            | 8644        | 7.566                            | 50229       | 6.395                            |
| Total . . .     | 28074         |                                  | 127454      |                                  | 114249      |                                  | 785409      |                                  |
| Ages unknown    | 139           |                                  | 786         |                                  | 415         |                                  | 3384        |                                  |
| Grand Total .   | 28213         |                                  | 128240      |                                  | 114664      |                                  | 788793      |                                  |
|                 | ANGLESEA.     |                                  | BRECON.     |                                  | CARDIGAN.   |                                  | CARMARTHEN. |                                  |
|                 | Population.   | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . . .  | 9586          | 39.460                           | 9604        | 34.272                           | 12811       | 39.807                           | 20524       | 40.588                           |
| 15 ... 20 . . . | 2366          | 9.739                            | 2844        | 10.149                           | 3333        | 10.356                           | 5196        | 10.275                           |
| 20 ... 25 . . . | 1902          | 7.829                            | 2775        | 9.903                            | 2639        | 8.200                            | 4009        | 7.928                            |
| 25 ... 30 . . . | 1605          | 6.607                            | 2362        | 8.429                            | 2212        | 6.873                            | 3411        | 6.746                            |
| 30 ... 40 . . . | 2613          | 10.756                           | 3722        | 13.282                           | 3589        | 11.152                           | 5859        | 11.587                           |
| 40 ... 50 . . . | 2275          | 9.365                            | 2572        | 9.178                            | 2762        | 8.582                            | 4215        | 8.336                            |
| 50 ... 60 . . . | 1781          | 7.331                            | 1897        | 6.769                            | 2200        | 6.836                            | 3274        | 6.475                            |
| 60 & upwards .  | 2165          | 8.912                            | 2247        | 8.018                            | 2637        | 8.194                            | 4079        | 8.067                            |
| Total . . .     | 24293         |                                  | 28023       |                                  | 32183       |                                  | 50567       |                                  |
| Ages unknown    | 81            |                                  | 51          |                                  | 32          |                                  | 109         |                                  |
| Grand Total .   | 24374         |                                  | 28074       |                                  | 32215       |                                  | 50676       |                                  |
|                 | CARNARVON.    |                                  | DENBIGH.    |                                  | FLINT.      |                                  | GLAMORGAN.  |                                  |
|                 | Population.   | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . . .  | 14931         | 37.860                           | 16535       | 37.264                           | 12746       | 38.098                           | 31177       | 35.666                           |
| 15 ... 20 . . . | 3939          | 9.988                            | 4691        | 10.572                           | 3599        | 10.757                           | 8797        | 10.064                           |
| 20 ... 25 . . . | 3497          | 8.867                            | 3842        | 8.658                            | 3077        | 9.197                            | 9476        | 10.840                           |
| 25 ... 30 . . . | 3135          | 7.949                            | 3166        | 7.135                            | 2507        | 7.493                            | 8006        | 9.159                            |
| 30 ... 40 . . . | 4880          | 12.374                           | 5307        | 11.960                           | 4090        | 12.225                           | 12406       | 14.192                           |
| 40 ... 50 . . . | 3474          | 8.809                            | 4119        | 9.283                            | 3084        | 9.218                            | 7720        | 8.832                            |
| 50 ... 60 . . . | 2646          | 6.709                            | 3131        | 7.056                            | 2130        | 6.367                            | 4810        | 5.503                            |
| 60 & upwards .  | 2935          | 7.442                            | 3582        | 8.073                            | 2223        | 6.645                            | 5022        | 5.745                            |
| Total . . .     | 39437         |                                  | 44373       |                                  | 33456       |                                  | 87414       |                                  |
| Ages unknown    | 188           |                                  | 55          |                                  | 352         |                                  | 455         |                                  |
| Grand Total .   | 39625         |                                  | 44428       |                                  | 33808       |                                  | 87869       |                                  |



TABLE V.—(continued.)

*Population of England and Wales.—1841.—Males.*

| Age.           | MERIONETH.  |                                  | MONTGOMERY. |                                  | PEMBROKE.   |                                  | RADNOR.     |                                  |
|----------------|-------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|
|                | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. | Population. | Per centage to the total living. |
| Under 15 . .   | 7027        | 36.481                           | 12932       | 37.763                           | 16175       | 40.317                           | 4731        | 36.949                           |
| 15...20 . .    | 1817        | 9.433                            | 3547        | 10.358                           | 4067        | 10.137                           | 1.05        | 10.192                           |
| 20...25 . .    | 1611        | 8.364                            | 2850        | 8.322                            | 3160        | 7.877                            | 1217        | 9.505                            |
| 25...30 . .    | 1515        | 7.865                            | 2359        | 6.889                            | 2592        | 6.461                            | 914         | 7.138                            |
| 30...40 . .    | 2342        | 12.159                           | 3948        | 11.529                           | 4485        | 11.179                           | 1359        | 10.614                           |
| 40...50 . .    | 1697        | 8.810                            | 3089        | 9.020                            | 3615        | 9.011                            | 1188        | 9.278                            |
| 50...60 . .    | 1436        | 7.455                            | 2579        | 7.531                            | 2649        | 6.603                            | 937         | 7.318                            |
| 60 & upwards . | 1817        | 9.433                            | 2941        | 8.588                            | 3376        | 8.415                            | 1153        | 9.005                            |
| Total . .      | 19262       |                                  | 34245       |                                  | 40119       |                                  | 12804       |                                  |
| Ages unknown   | 17          |                                  | 38          |                                  | 131         |                                  | 22          |                                  |
| Grand Total .  | 19279       |                                  | 34283       |                                  | 40250       |                                  | 12826       |                                  |

| Age.           | MALES.—ENGLAND AND WALES. |                                  | FEMALES.—ENGLAND AND WALES. |                                  |
|----------------|---------------------------|----------------------------------|-----------------------------|----------------------------------|
|                | Population.               | Per centage to the total living. | Population.                 | Per centage to the total living. |
| Under 15 . .   | 2938464                   | 36.693                           | 2924959                     | 34.913                           |
| 15...20 . .    | 805646                    | 10.064                           | 828311                      | 9.887                            |
| 20...25 . .    | 781450                    | 9.758                            | 859634                      | 10.261                           |
| 25...30 . .    | 613999                    | 7.667                            | 698583                      | 8.338                            |
| 30...40 . .    | 1040626                   | 12.994                           | 1090191                     | 13.013                           |
| 40...50 . .    | 773141                    | 9.654                            | 802578                      | 9.580                            |
| 50...60 . .    | 509258                    | 6.359                            | 544528                      | 6.500                            |
| 60 & upwards . | 545510                    | 6.812                            | 628928                      | 7.854                            |
| Total . .      | 8008094                   |                                  | 8377712                     |                                  |

The peculiar results arising out of the three preceding Tables, and the influence which a difference in the distribution of the population according to age has in altering the apparent ratio of crime to the population, when the element of age does not enter into the inquiry, will at once become evident. In Tables I and II it was shewn that the tendency to crime at some periods of life was more than quadruple that at other periods; and by Table V it appears, that the ratio of the population alive at the respective periods differs widely in the several counties. In Anglesea, Carmarthen, and Dorset, the proportion of the population alive at the quinquennial term of life 20 to 25, is under 8 per cent. of the whole; but in the counties of Lancaster, Middlesex, and Monmouth, the proportion varies [from 10 per cent.



TABLE VI.

*Criminal Offenders in each County of England and Wales during 1842, 1843, and 1844.—Males.*

| COUNTIES.            | Aged<br>under<br>15 years. | Aged<br>15 years<br>and<br>under 20 | Aged<br>20 years<br>and<br>under 25. | Aged<br>25 years<br>and<br>under 30. | Aged<br>30 years<br>and<br>under 40. | Aged<br>40 years<br>and<br>under 50. | Aged<br>50 years<br>and<br>under 60. | Aged<br>60 years<br>and<br>upwards. | Ages<br>not<br>known. | Total. |
|----------------------|----------------------------|-------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|-----------------------|--------|
| BEDFORD . . . 1842   | 6                          | 42                                  | 64                                   | 32                                   | 29                                   | 13                                   | 10                                   | 6                                   | 1                     | 203    |
| 1843                 | 8                          | 31                                  | 37                                   | 35                                   | 33                                   | 27                                   | 5                                    | 2                                   | 2                     | 180    |
| 1844                 | 13                         | 42                                  | 39                                   | 19                                   | 31                                   | 16                                   | 5                                    | 3                                   | ...                   | 168    |
| Total . . . .        | 27                         | 115                                 | 140                                  | 86                                   | 93                                   | 56                                   | 20                                   | 11                                  | 3                     | 551    |
| Average . . . .      | 9                          | 38                                  | 47                                   | 29                                   | 31                                   | 19                                   | 7                                    | 4                                   | ...                   | 184    |
| BERKS . . . . 1842   | 12                         | 60                                  | 59                                   | 31                                   | 55                                   | 36                                   | 16                                   | 5                                   | 4                     | 278    |
| 1843                 | 17                         | 56                                  | 71                                   | 37                                   | 47                                   | 19                                   | 5                                    | 5                                   | 28                    | 285    |
| 1844                 | 8                          | 57                                  | 66                                   | 35                                   | 37                                   | 21                                   | 15                                   | 4                                   | ...                   | 243    |
| Total . . . .        | 37                         | 173                                 | 196                                  | 103                                  | 139                                  | 76                                   | 36                                   | 14                                  | 32                    | 806    |
| Average . . . .      | 12                         | 58                                  | 65                                   | 34                                   | 46                                   | 25                                   | 12                                   | 5                                   | ...                   | 269    |
| BUCKS . . . . 1842   | 4                          | 51                                  | 81                                   | 45                                   | 39                                   | 17                                   | 9                                    | 5                                   | 3                     | 254    |
| 1843                 | 11                         | 61                                  | 76                                   | 39                                   | 56                                   | 26                                   | 4                                    | 7                                   | 2                     | 282    |
| 1844                 | 14                         | 68                                  | 49                                   | 43                                   | 49                                   | 17                                   | 14                                   | 4                                   | 5                     | 263    |
| Total . . . .        | 29                         | 180                                 | 206                                  | 127                                  | 144                                  | 60                                   | 27                                   | 16                                  | 10                    | 799    |
| Average . . . .      | 10                         | 60                                  | 69                                   | 42                                   | 48                                   | 20                                   | 9                                    | 5                                   | ...                   | 266    |
| CAMBRIDGE . . 1842   | 9                          | 47                                  | 64                                   | 30                                   | 35                                   | 18                                   | 8                                    | 1                                   | 1                     | 213    |
| 1843                 | 12                         | 48                                  | 59                                   | 29                                   | 43                                   | 16                                   | 11                                   | 2                                   | 4                     | 224    |
| 1844                 | 11                         | 47                                  | 75                                   | 53                                   | 29                                   | 25                                   | 11                                   | 1                                   | 3                     | 255    |
| Total . . . .        | 32                         | 142                                 | 198                                  | 112                                  | 107                                  | 59                                   | 30                                   | 4                                   | 8                     | 692    |
| Average . . . .      | 11                         | 47                                  | 66                                   | 37                                   | 36                                   | 20                                   | 10                                   | 1                                   | ...                   | 231    |
| CHESTER . . . . 1842 | 50                         | 196                                 | 220                                  | 134                                  | 169                                  | 76                                   | 48                                   | 18                                  | 4                     | 915    |
| 1843                 | 61                         | 158                                 | 177                                  | 133                                  | 163                                  | 79                                   | 41                                   | 25                                  | 11                    | 848    |
| 1844                 | 73                         | 127                                 | 145                                  | 100                                  | 84                                   | 62                                   | 21                                   | 16                                  | 2                     | 630    |
| Total . . . .        | 184                        | 481                                 | 542                                  | 367                                  | 416                                  | 217                                  | 110                                  | 59                                  | 17                    | 2393   |
| Average . . . .      | 61                         | 160                                 | 181                                  | 122                                  | 139                                  | 72                                   | 37                                   | 20                                  | ...                   | 798    |
| CORNWALL . . . 1842  | 14                         | 46                                  | 51                                   | 35                                   | 32                                   | 16                                   | 7                                    | 6                                   | 8                     | 215    |
| 1843                 | 18                         | 48                                  | 54                                   | 33                                   | 41                                   | 17                                   | 8                                    | 7                                   | ...                   | 226    |
| 1844                 | 16                         | 49                                  | 45                                   | 34                                   | 32                                   | 24                                   | 9                                    | 2                                   | 2                     | 213    |
| Total . . . .        | 48                         | 143                                 | 150                                  | 102                                  | 105                                  | 57                                   | 24                                   | 15                                  | 10                    | 654    |
| Average . . . .      | 16                         | 48                                  | 50                                   | 34                                   | 35                                   | 19                                   | 8                                    | 5                                   | ...                   | 218    |
| CUMBERLAND . . 1842  | 2                          | 16                                  | 12                                   | 10                                   | 16                                   | 10                                   | 4                                    | 5                                   | 1                     | 76     |
| 1843                 | 4                          | 11                                  | 12                                   | 12                                   | 12                                   | 8                                    | 9                                    | 3                                   | ...                   | 71     |
| 1844                 | 6                          | 9                                   | 17                                   | 21                                   | 20                                   | 14                                   | 4                                    | 4                                   | 3                     | 98     |
| Total . . . .        | 12                         | 36                                  | 41                                   | 43                                   | 48                                   | 32                                   | 17                                   | 12                                  | 4                     | 245    |
| Average . . . .      | 4                          | 12                                  | 14                                   | 14                                   | 16                                   | 11                                   | 6                                    | 4                                   | ...                   | 82     |



TABLE VI.—(continued.)

| COUNTIES.           | Aged<br>under<br>15 years. | Aged<br>15 years<br>and<br>under 20. | Aged<br>20 years<br>and<br>under 25. | Aged<br>25 years<br>and<br>under 30. | Aged<br>30 years<br>and<br>under 40. | Aged<br>40 years<br>and<br>under 50. | Aged<br>50 years<br>and<br>under 60. | Aged<br>60 years<br>and<br>upwards. | Ages not<br>known. | Total. |
|---------------------|----------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------|--------|
| DERBY . . . . 1842  | 10                         | 32                                   | 83                                   | 45                                   | 57                                   | 37                                   | 15                                   | 8                                   | 9                  | 296    |
| 1843                | 6                          | 46                                   | 67                                   | 61                                   | 65                                   | 23                                   | 6                                    | 7                                   | 7                  | 288    |
| 1844                | 7                          | 42                                   | 59                                   | 45                                   | 49                                   | 19                                   | 14                                   | 7                                   | 4                  | 246    |
| Total . . . .       | 23                         | 120                                  | 209                                  | 151                                  | 171                                  | 79                                   | 35                                   | 22                                  | 20                 | 830    |
| Average . . . .     | 8                          | 40                                   | 70                                   | 50                                   | 57                                   | 26                                   | 12                                   | 7                                   | ...                | 277    |
| DEVON . . . . 1842  | 20                         | 110                                  | 126                                  | 88                                   | 89                                   | 49                                   | 22                                   | 13                                  | 5                  | 522    |
| 1843                | 21                         | 125                                  | 136                                  | 98                                   | 105                                  | 45                                   | 25                                   | 6                                   | 2                  | 563    |
| 1844                | 35                         | 96                                   | 143                                  | 101                                  | 91                                   | 61                                   | 23                                   | 13                                  | 1                  | 564    |
| Total . . . .       | 76                         | 331                                  | 405                                  | 287                                  | 285                                  | 155                                  | 70                                   | 32                                  | 8                  | 1649   |
| Average . . . .     | 25                         | 110                                  | 135                                  | 96                                   | 95                                   | 52                                   | 23                                   | 11                                  | ...                | 550    |
| DORSET . . . . 1842 | 7                          | 44                                   | 47                                   | 30                                   | 38                                   | 11                                   | 9                                    | 13                                  | 8                  | 207    |
| 1843                | 6                          | 43                                   | 48                                   | 30                                   | 43                                   | 12                                   | 8                                    | 10                                  | 10                 | 210    |
| 1844                | 8                          | 31                                   | 41                                   | 17                                   | 26                                   | 18                                   | 5                                    | 5                                   | 11                 | 162    |
| Total . . . .       | 21                         | 118                                  | 136                                  | 77                                   | 107                                  | 41                                   | 22                                   | 28                                  | 29                 | 579    |
| Average . . . .     | 7                          | 39                                   | 45                                   | 26                                   | 36                                   | 14                                   | 7                                    | 9                                   | ...                | 193    |
| DURHAM . . . . 1842 | 16                         | 38                                   | 45                                   | 44                                   | 33                                   | 22                                   | 4                                    | 4                                   | 3                  | 209    |
| 1843                | 7                          | 52                                   | 59                                   | 42                                   | 47                                   | 18                                   | 4                                    | 4                                   | 9                  | 242    |
| 1844                | 13                         | 61                                   | 86                                   | 55                                   | 46                                   | 30                                   | 13                                   | 5                                   | 2                  | 311    |
| Total . . . .       | 36                         | 151                                  | 190                                  | 141                                  | 126                                  | 70                                   | 21                                   | 13                                  | 14                 | 762    |
| Average . . . .     | 12                         | 50                                   | 63                                   | 47                                   | 42                                   | 23                                   | 7                                    | 4                                   | ...                | 254    |
| ESSEX . . . . 1842  | 24                         | 155                                  | 189                                  | 99                                   | 102                                  | 56                                   | 27                                   | 13                                  | 8                  | 673    |
| 1843                | 33                         | 147                                  | 151                                  | 88                                   | 106                                  | 48                                   | 17                                   | 15                                  | 6                  | 611    |
| 1844                | 34                         | 133                                  | 114                                  | 69                                   | 88                                   | 39                                   | 16                                   | 6                                   | 8                  | 507    |
| Total . . . .       | 91                         | 435                                  | 454                                  | 256                                  | 296                                  | 143                                  | 60                                   | 34                                  | 22                 | 1791   |
| Average . . . .     | 30                         | 145                                  | 151                                  | 85                                   | 99                                   | 48                                   | 20                                   | 11                                  | ...                | 597    |
| GLOUCESTER . . 1842 | 98                         | 267                                  | 226                                  | 131                                  | 150                                  | 71                                   | 42                                   | 14                                  | 32                 | 1031   |
| 1843                | 104                        | 253                                  | 208                                  | 122                                  | 141                                  | 70                                   | 30                                   | 19                                  | 15                 | 962    |
| 1844                | 65                         | 245                                  | 206                                  | 105                                  | 118                                  | 65                                   | 34                                   | 15                                  | 20                 | 873    |
| Total . . . .       | 267                        | 765                                  | 640                                  | 358                                  | 409                                  | 206                                  | 106                                  | 48                                  | 67                 | 2866   |
| Average . . . .     | 89                         | 255                                  | 213                                  | 119                                  | 136                                  | 69                                   | 35                                   | 16                                  | ...                | 955    |
| HEREFORD . . . 1842 | 8                          | 24                                   | 50                                   | 57                                   | 33                                   | 19                                   | 13                                   | 6                                   | ...                | 210    |
| 1843                | 7                          | 30                                   | 53                                   | 38                                   | 35                                   | 17                                   | 6                                    | 7                                   | ...                | 193    |
| 1844                | 4                          | 35                                   | 56                                   | 35                                   | 37                                   | 12                                   | 5                                    | 5                                   | 3                  | 192    |
| Total . . . .       | 19                         | 89                                   | 159                                  | 130                                  | 105                                  | 48                                   | 24                                   | 18                                  | 3                  | 595    |
| Average . . . .     | 6                          | 30                                   | 53                                   | 43                                   | 35                                   | 16                                   | 8                                    | 6                                   | ...                | 198    |
| HERTFORD . . . 1842 | 16                         | 58                                   | 76                                   | 44                                   | 64                                   | 29                                   | 9                                    | 4                                   | 4                  | 304    |
| 1843                | 8                          | 40                                   | 75                                   | 41                                   | 34                                   | 20                                   | 12                                   | 7                                   | 4                  | 241    |
| 1844                | 5                          | 55                                   | 66                                   | 32                                   | 53                                   | 20                                   | 4                                    | 3                                   | 6                  | 244    |
| Total . . . .       | 29                         | 153                                  | 217                                  | 117                                  | 151                                  | 69                                   | 25                                   | 14                                  | 14                 | 789    |
| Average . . . .     | 10                         | 51                                   | 72                                   | 39                                   | 50                                   | 23                                   | 8                                    | 5                                   | ...                | 263    |



TABLE VI.—(continued.)

| COUNTIES.           | Aged<br>under<br>15 years. | Aged<br>15 years<br>and<br>under 20. | Aged<br>20 years<br>and<br>under 25. | Aged<br>25 years<br>and<br>under 30. | Aged<br>30 years<br>and<br>under 40. | Aged<br>40 years<br>and<br>under 50. | Aged<br>50 years<br>and<br>under 60. | Aged<br>60 years<br>and<br>upwards. | Ages not<br>known. | Total. |
|---------------------|----------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------|--------|
| HUNTINGDON . . 1842 | 2                          | 13                                   | 17                                   | 11                                   | 11                                   | 3                                    | ...                                  | 1                                   | 2                  | 60     |
| 1843                | 4                          | 10                                   | 12                                   | 12                                   | 12                                   | 3                                    | 2                                    | 2                                   | 1                  | 58     |
| 1844                | 1                          | 14                                   | 20                                   | 13                                   | 8                                    | 6                                    | 2                                    | ...                                 | ...                | 64     |
| Total . . . .       | 7                          | 37                                   | 49                                   | 36                                   | 31                                   | 12                                   | 4                                    | 3                                   | 3                  | 182    |
| Average . . . .     | 2                          | 12                                   | 16                                   | 12                                   | 10                                   | 4                                    | 1                                    | 1                                   | ...                | 61     |
| KENT . . . . 1842   | 41                         | 209                                  | 234                                  | 138                                  | 163                                  | 99                                   | 36                                   | 23                                  | 29                 | 972    |
| 1843                | 34                         | 198                                  | 212                                  | 117                                  | 137                                  | 67                                   | 36                                   | 18                                  | 11                 | 830    |
| 1844                | 31                         | 169                                  | 214                                  | 137                                  | 105                                  | 54                                   | 17                                   | 17                                  | 11                 | 755    |
| Total . . . .       | 106                        | 576                                  | 660                                  | 392                                  | 405                                  | 220                                  | 89                                   | 58                                  | 51                 | 2557   |
| Average . . . .     | 35                         | 192                                  | 220                                  | 131                                  | 135                                  | 73                                   | 30                                   | 19                                  | ...                | 852    |
| LANCASTER . . 1842  | 208                        | 759                                  | 861                                  | 589                                  | 652                                  | 280                                  | 91                                   | 42                                  | 68                 | 3550   |
| 1843                | 155                        | 613                                  | 658                                  | 446                                  | 494                                  | 272                                  | 95                                   | 27                                  | 70                 | 2830   |
| 1844                | 191                        | 540                                  | 497                                  | 310                                  | 359                                  | 175                                  | 61                                   | 33                                  | 38                 | 2204   |
| Total . . . .       | 554                        | 1912                                 | 2016                                 | 1345                                 | 1505                                 | 727                                  | 247                                  | 102                                 | 176                | 8584   |
| Average . . . .     | 185                        | 637                                  | 672                                  | 448                                  | 502                                  | 242                                  | 82                                   | 34                                  | ...                | 2861   |
| LEICESTER . . 1842  | 29                         | 90                                   | 108                                  | 66                                   | 72                                   | 32                                   | 11                                   | 14                                  | 1                  | 423    |
| 1843                | 21                         | 115                                  | 114                                  | 75                                   | 82                                   | 30                                   | 10                                   | 14                                  | 3                  | 454    |
| 1844                | 26                         | 111                                  | 98                                   | 57                                   | 70                                   | 37                                   | 12                                   | 7                                   | 7                  | 425    |
| Total . . . .       | 76                         | 316                                  | 320                                  | 198                                  | 224                                  | 89                                   | 33                                   | 35                                  | 11                 | 1302   |
| Average . . . .     | 25                         | 105                                  | 107                                  | 66                                   | 75                                   | 30                                   | 11                                   | 12                                  | ...                | 434    |
| LINCOLN . . . 1842  | 5                          | 66                                   | 107                                  | 89                                   | 73                                   | 32                                   | 15                                   | 7                                   | 13                 | 407    |
| 1843                | 11                         | 90                                   | 143                                  | 68                                   | 91                                   | 42                                   | 16                                   | 6                                   | 10                 | 477    |
| 1844                | 16                         | 70                                   | 138                                  | 86                                   | 80                                   | 38                                   | 10                                   | 2                                   | 10                 | 450    |
| Total . . . .       | 32                         | 226                                  | 388                                  | 243                                  | 244                                  | 112                                  | 41                                   | 15                                  | 33                 | 1334   |
| Average . . . .     | 11                         | 75                                   | 129                                  | 81                                   | 81                                   | 37                                   | 14                                   | 5                                   | ...                | 445    |
| MIDDLESEX . . 1842  | 240                        | 878                                  | 710                                  | 387                                  | 441                                  | 231                                  | 81                                   | 51                                  | 86                 | 3105   |
| 1843                | 307                        | 991                                  | 725                                  | 381                                  | 418                                  | 222                                  | 91                                   | 32                                  | 113                | 3280   |
| 1844                | 238                        | 869                                  | 694                                  | 373                                  | 406                                  | 228                                  | 129                                  | 42                                  | 100                | 3079   |
| Total . . . .       | 785                        | 2738                                 | 2129                                 | 1141                                 | 1265                                 | 681                                  | 301                                  | 125                                 | 299                | 9464   |
| Average . . . .     | 262                        | 913                                  | 710                                  | 380                                  | 422                                  | 227                                  | 100                                  | 42                                  | ...                | 3155   |
| MONMOUTH . . 1842   | 7                          | 34                                   | 44                                   | 38                                   | 51                                   | 22                                   | 12                                   | 2                                   | 3                  | 213    |
| 1843                | 7                          | 31                                   | 57                                   | 41                                   | 43                                   | 14                                   | 5                                    | 4                                   | 6                  | 208    |
| 1844                | 4                          | 38                                   | 51                                   | 31                                   | 39                                   | 13                                   | 6                                    | 9                                   | 10                 | 201    |
| Total . . . .       | 18                         | 103                                  | 152                                  | 110                                  | 133                                  | 49                                   | 23                                   | 15                                  | 19                 | 622    |
| Average . . . .     | 6                          | 34                                   | 51                                   | 37                                   | 44                                   | 16                                   | 8                                    | 5                                   | ...                | 207    |
| NORFOLK . . . 1842  | 67                         | 180                                  | 166                                  | 84                                   | 91                                   | 47                                   | 29                                   | 13                                  | 4                  | 681    |
| 1843                | 31                         | 179                                  | 162                                  | 93                                   | 112                                  | 44                                   | 20                                   | 15                                  | 9                  | 665    |
| 1844                | 63                         | 168                                  | 164                                  | 91                                   | 72                                   | 45                                   | 26                                   | 19                                  | 13                 | 661    |
| Total . . . .       | 161                        | 527                                  | 492                                  | 268                                  | 275                                  | 136                                  | 75                                   | 47                                  | 26                 | 2007   |
| Average . . . .     | 54                         | 176                                  | 164                                  | 89                                   | 92                                   | 45                                   | 25                                   | 16                                  | ...                | 669    |



TABLE VI.—(continued.)

| COUNTIES.             | Aged<br>under<br>15 years. | Aged<br>15 years<br>and<br>under 20. | Aged<br>20 years<br>and<br>under 25. | Aged<br>25 years<br>and<br>under 30. | Aged<br>30 years<br>and<br>under 40. | Aged<br>40 years<br>and<br>under 50. | Aged<br>50 years<br>and<br>under 60. | Aged<br>60 years<br>and<br>upwards. | Ages not<br>known. | Total. |
|-----------------------|----------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------|--------|
| NORTHAMPTON . . 1842  | 19                         | 56                                   | 79                                   | 35                                   | 55                                   | 25                                   | 14                                   | 6                                   | 19                 | 308    |
| 1843                  | 6                          | 38                                   | 81                                   | 47                                   | 34                                   | 19                                   | 8                                    | 7                                   | 5                  | 245    |
| 1844                  | 9                          | 43                                   | 65                                   | 52                                   | 39                                   | 29                                   | 10                                   | 6                                   | 7                  | 260    |
| Total . . . .         | 34                         | 137                                  | 225                                  | 134                                  | 128                                  | 73                                   | 32                                   | 19                                  | 31                 | 813    |
| Average . . .         | 11                         | 46                                   | 75                                   | 45                                   | 43                                   | 24                                   | 11                                   | 6                                   | ...                | 271    |
| NORTHUMBERLAND 1842   | 18                         | 50                                   | 46                                   | 22                                   | 34                                   | 14                                   | 7                                    | ...                                 | 2                  | 193    |
| 1843                  | 28                         | 55                                   | 45                                   | 24                                   | 27                                   | 10                                   | 8                                    | 4                                   | 23                 | 224    |
| 1844                  | 19                         | 42                                   | 57                                   | 31                                   | 30                                   | 14                                   | 4                                    | 3                                   | 17                 | 217    |
| Total . . . .         | 65                         | 147                                  | 148                                  | 77                                   | 91                                   | 38                                   | 19                                   | 7                                   | 42                 | 634    |
| Average . . .         | 22                         | 49                                   | 49                                   | 26                                   | 30                                   | 13                                   | 6                                    | 2                                   | ...                | 211    |
| NOTTINGHAM . . 1842   | 10                         | 75                                   | 87                                   | 52                                   | 51                                   | 27                                   | 12                                   | 3                                   | 8                  | 325    |
| 1843                  | 18                         | 64                                   | 105                                  | 32                                   | 53                                   | 23                                   | 8                                    | 6                                   | 1                  | 310    |
| 1844                  | 28                         | 67                                   | 71                                   | 38                                   | 47                                   | 32                                   | 11                                   | 1                                   | 2                  | 297    |
| Total . . . .         | 56                         | 206                                  | 263                                  | 122                                  | 151                                  | 82                                   | 31                                   | 10                                  | 11                 | 932    |
| Average . . .         | 19                         | 69                                   | 88                                   | 41                                   | 50                                   | 27                                   | 10                                   | 3                                   | ...                | 311    |
| OXFORD . . . . 1842   | 15                         | 56                                   | 66                                   | 43                                   | 58                                   | 26                                   | 13                                   | 5                                   | 4                  | 286    |
| 1843                  | 15                         | 35                                   | 77                                   | 53                                   | 50                                   | 21                                   | 7                                    | 9                                   | 9                  | 276    |
| 1844                  | 15                         | 54                                   | 68                                   | 40                                   | 40                                   | 20                                   | 6                                    | 6                                   | 10                 | 259    |
| Total . . . .         | 45                         | 145                                  | 211                                  | 136                                  | 148                                  | 67                                   | 26                                   | 20                                  | 23                 | 821    |
| Average . . .         | 15                         | 48                                   | 70                                   | 45                                   | 49                                   | 22                                   | 9                                    | 7                                   | ...                | 274    |
| RUTLAND . . . . 1842  | 1                          | 2                                    | 17                                   | 9                                    | 7                                    | 4                                    | 4                                    | ...                                 | ...                | 44     |
| 1843                  | 1                          | 3                                    | 12                                   | 5                                    | 5                                    | 4                                    | ...                                  | ...                                 | 2                  | 32     |
| 1844                  | ...                        | 3                                    | 3                                    | 2                                    | 9                                    | 2                                    | ...                                  | 1                                   | ...                | 20     |
| Total . . . .         | 2                          | 8                                    | 32                                   | 16                                   | 21                                   | 10                                   | 4                                    | 1                                   | 2                  | 96     |
| Average . . .         | 1                          | 3                                    | 11                                   | 5                                    | 7                                    | 3                                    | 1                                    | ...                                 | ...                | 32     |
| SALOP . . . . . 1842  | 18                         | 74                                   | 98                                   | 56                                   | 78                                   | 35                                   | 23                                   | 10                                  | 3                  | 395    |
| 1843                  | 20                         | 87                                   | 93                                   | 80                                   | 85                                   | 45                                   | 17                                   | 13                                  | 5                  | 445    |
| 1844                  | 19                         | 61                                   | 87                                   | 54                                   | 66                                   | 39                                   | 23                                   | 15                                  | 1                  | 365    |
| Total . . . .         | 57                         | 222                                  | 278                                  | 190                                  | 229                                  | 119                                  | 63                                   | 38                                  | 9                  | 1205   |
| Average . . .         | 19                         | 74                                   | 93                                   | 63                                   | 76                                   | 40                                   | 21                                   | 13                                  | ...                | 402    |
| SOMERSET . . . . 1842 | 52                         | 219                                  | 237                                  | 144                                  | 143                                  | 61                                   | 32                                   | 14                                  | 80                 | 982    |
| 1843                  | 51                         | 204                                  | 214                                  | 117                                  | 106                                  | 54                                   | 24                                   | 26                                  | 35                 | 831    |
| 1844                  | 47                         | 238                                  | 221                                  | 122                                  | 98                                   | 51                                   | 33                                   | 20                                  | 49                 | 879    |
| Total . . . .         | 150                        | 661                                  | 672                                  | 383                                  | 347                                  | 166                                  | 89                                   | 60                                  | 164                | 2692   |
| Average . . .         | 50                         | 220                                  | 224                                  | 128                                  | 116                                  | 55                                   | 30                                   | 20                                  | ...                | 897    |
| SOUTHAMPTON . . 1842  | 27                         | 109                                  | 149                                  | 83                                   | 102                                  | 45                                   | 38                                   | 16                                  | 6                  | 575    |
| 1843                  | 24                         | 115                                  | 150                                  | 92                                   | 87                                   | 48                                   | 19                                   | 10                                  | 7                  | 552    |
| 1844                  | 28                         | 87                                   | 122                                  | 74                                   | 45                                   | 33                                   | 18                                   | 10                                  | 7                  | 424    |
| Total . . . .         | 79                         | 311                                  | 421                                  | 249                                  | 234                                  | 126                                  | 75                                   | 36                                  | 20                 | 1551   |
| Average . . .         | 26                         | 104                                  | 140                                  | 83                                   | 78                                   | 42                                   | 25                                   | 12                                  | ...                | 517    |



TABLE VI.—(continued.)

| COUNTIES.           | Aged<br>under<br>15 years. | Aged<br>15 years<br>and<br>under 20. | Aged<br>20 years<br>and<br>under 25. | Aged<br>25 years<br>and<br>under 30. | Aged<br>30 years<br>and<br>under 40. | Aged<br>40 years<br>and<br>under 50. | Aged<br>50 years<br>and<br>under 60. | Aged<br>60 years<br>and<br>upwards. | Ages not<br>known. | Total. |
|---------------------|----------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------|--------|
| STAFFORD . . . 1842 | 58                         | 238                                  | 355                                  | 202                                  | 252                                  | 100                                  | 43                                   | 26                                  | 21                 | 1295   |
| 1843                | 45                         | 166                                  | 244                                  | 189                                  | 151                                  | 71                                   | 40                                   | 17                                  | 55                 | 978    |
| 1844                | 44                         | 125                                  | 169                                  | 113                                  | 136                                  | 60                                   | 32                                   | 12                                  | 19                 | 710    |
| Total . . . .       | 147                        | 529                                  | 768                                  | 504                                  | 539                                  | 231                                  | 115                                  | 55                                  | 95                 | 2983   |
| Average . . . .     | 49                         | 176                                  | 256                                  | 168                                  | 180                                  | 77                                   | 38                                   | 18                                  | ...                | 994    |
| SUFFOLK . . . 1842  | 22                         | 85                                   | 135                                  | 55                                   | 76                                   | 36                                   | 18                                   | 11                                  | 9                  | 447    |
| 1843                | 39                         | 111                                  | 142                                  | 79                                   | 75                                   | 32                                   | 18                                   | 12                                  | 9                  | 517    |
| 1844                | 18                         | 153                                  | 145                                  | 78                                   | 74                                   | 33                                   | 15                                   | 12                                  | 10                 | 538    |
| Total . . . .       | 79                         | 349                                  | 422                                  | 212                                  | 225                                  | 101                                  | 51                                   | 35                                  | 28                 | 1502   |
| Average . . . .     | 26                         | 116                                  | 141                                  | 71                                   | 75                                   | 34                                   | 17                                   | 12                                  | ...                | 501    |
| SURREY . . . 1842   | 49                         | 194                                  | 200                                  | 124                                  | 106                                  | 58                                   | 31                                   | 10                                  | 9                  | 781    |
| 1843                | 34                         | 167                                  | 182                                  | 104                                  | 97                                   | 54                                   | 30                                   | 12                                  | 10                 | 690    |
| 1844                | 49                         | 225                                  | 194                                  | 103                                  | 87                                   | 33                                   | 28                                   | 14                                  | 14                 | 747    |
| Total . . . .       | 132                        | 586                                  | 576                                  | 331                                  | 290                                  | 145                                  | 89                                   | 36                                  | 33                 | 2218   |
| Average . . . .     | 44                         | 195                                  | 192                                  | 110                                  | 97                                   | 48                                   | 30                                   | 12                                  | ...                | 739    |
| SUSSEX . . . 1842   | 19                         | 109                                  | 126                                  | 65                                   | 79                                   | 36                                   | 21                                   | 14                                  | ...                | 469    |
| 1843                | 32                         | 97                                   | 88                                   | 53                                   | 71                                   | 43                                   | 14                                   | 10                                  | 2                  | 410    |
| 1844                | 22                         | 70                                   | 77                                   | 45                                   | 66                                   | 32                                   | 19                                   | 9                                   | ...                | 340    |
| Total . . . .       | 73                         | 276                                  | 291                                  | 163                                  | 216                                  | 111                                  | 54                                   | 33                                  | 2                  | 1219   |
| Average . . . .     | 24                         | 92                                   | 97                                   | 54                                   | 72                                   | 37                                   | 18                                   | 11                                  | ...                | 406    |
| WARWICK . . . 1842  | 60                         | 230                                  | 206                                  | 105                                  | 141                                  | 72                                   | 18                                   | 13                                  | 1                  | 846    |
| 1843                | 75                         | 256                                  | 211                                  | 109                                  | 129                                  | 51                                   | 19                                   | 11                                  | 7                  | 868    |
| 1844                | 54                         | 191                                  | 183                                  | 120                                  | 122                                  | 59                                   | 26                                   | 12                                  | 8                  | 775    |
| Total . . . .       | 189                        | 677                                  | 600                                  | 334                                  | 392                                  | 182                                  | 63                                   | 36                                  | 16                 | 2489   |
| Average . . . .     | 63                         | 226                                  | 200                                  | 111                                  | 131                                  | 61                                   | 21                                   | 12                                  | ...                | 830    |
| WESTMORELAND . 1842 | ...                        | 3                                    | 7                                    | 10                                   | 5                                    | 2                                    | 1                                    | 1                                   | 1                  | 30     |
| 1843                | 2                          | 5                                    | 13                                   | 7                                    | 3                                    | 3                                    | ...                                  | 1                                   | ...                | 34     |
| 1844                | 1                          | 4                                    | 5                                    | 2                                    | 5                                    | ...                                  | 1                                    | ...                                 | ...                | 18     |
| Total . . . .       | 3                          | 12                                   | 25                                   | 19                                   | 13                                   | 5                                    | 2                                    | 2                                   | 1                  | 82     |
| Average . . . .     | 1                          | 4                                    | 8                                    | 6                                    | 4                                    | 2                                    | 1                                    | 1                                   | ...                | 27     |
| WILTS . . . 1842    | 20                         | 123                                  | 122                                  | 69                                   | 84                                   | 35                                   | 22                                   | 10                                  | 6                  | 491    |
| 1843                | 14                         | 92                                   | 105                                  | 56                                   | 75                                   | 32                                   | 15                                   | 8                                   | 2                  | 399    |
| 1844                | 25                         | 84                                   | 97                                   | 44                                   | 59                                   | 32                                   | 19                                   | 7                                   | 6                  | 373    |
| Total . . . .       | 59                         | 299                                  | 324                                  | 169                                  | 218                                  | 99                                   | 56                                   | 25                                  | 14                 | 1263   |
| Average . . . .     | 20                         | 100                                  | 108                                  | 56                                   | 73                                   | 33                                   | 19                                   | 8                                   | ...                | 421    |
| WORCESTER . . 1842  | 23                         | 117                                  | 110                                  | 86                                   | 85                                   | 33                                   | 24                                   | 7                                   | 22                 | 507    |
| 1843                | 32                         | 117                                  | 159                                  | 95                                   | 91                                   | 48                                   | 17                                   | 3                                   | 13                 | 575    |
| 1844                | 30                         | 115                                  | 134                                  | 70                                   | 82                                   | 45                                   | 26                                   | 9                                   | 11                 | 516    |
| Total . . . .       | 85                         | 349                                  | 403                                  | 251                                  | 258                                  | 126                                  | 61                                   | 19                                  | 46                 | 1598   |
| Average . . . .     | 28                         | 116                                  | 134                                  | 84                                   | 86                                   | 42                                   | 20                                   | 6                                   | ...                | 533    |



TABLE VI.—(continued.)

| COUNTIES.            | Aged<br>under<br>15 years. | Aged<br>15 years<br>and<br>under 20. | Aged<br>20 years<br>and<br>under 25. | Aged<br>25 years<br>and<br>under 30. | Aged<br>30 years<br>and<br>under 40. | Aged<br>40 years<br>and<br>under 50. | Aged<br>50 years<br>and<br>under 60. | Aged<br>60 years<br>and<br>upwards. | Ages not<br>known. | Total. |
|----------------------|----------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------|--------|
| YORK . . . . 1842    | 105                        | 399                                  | 580                                  | 427                                  | 398                                  | 179                                  | 80                                   | 26                                  | 24                 | 2218   |
| 1843                 | 78                         | 415                                  | 543                                  | 337                                  | 328                                  | 124                                  | 53                                   | 31                                  | 20                 | 1929   |
| 1844                 | 76                         | 298                                  | 332                                  | 246                                  | 226                                  | 100                                  | 46                                   | 28                                  | 16                 | 1368   |
| Total . . . .        | 259                        | 1112                                 | 1455                                 | 1010                                 | 952                                  | 403                                  | 179                                  | 85                                  | 60                 | 5515   |
| Average . . . .      | 86                         | 371                                  | 485                                  | 337                                  | 317                                  | 134                                  | 60                                   | 28                                  | ...                | 1838   |
| ANGLESEA . . . 1842  | ...                        | 2                                    | 3                                    | 2                                    | 3                                    | 4                                    | 2                                    | 1                                   | ...                | 17     |
| 1843                 | ...                        | 2                                    | 4                                    | 1                                    | 4                                    | ...                                  | 1                                    | ...                                 | 4                  | 16     |
| 1844                 | ...                        | 3                                    | ...                                  | 1                                    | 1                                    | ...                                  | ...                                  | ...                                 | 1                  | 6      |
| Total . . . .        | ...                        | 7                                    | 7                                    | 4                                    | 8                                    | 4                                    | 3                                    | 1                                   | 5                  | 39     |
| Average . . . .      | ...                        | 2                                    | 2                                    | 1                                    | 3                                    | 1                                    | 1                                    | ...                                 | ...                | 13     |
| BRECON . . . . 1842  | ...                        | 4                                    | 14                                   | 12                                   | 9                                    | 10                                   | 2                                    | 2                                   | ...                | 53     |
| 1843                 | 2                          | 7                                    | 12                                   | 9                                    | 12                                   | 11                                   | ...                                  | 1                                   | 2                  | 56     |
| 1844                 | ...                        | 4                                    | 12                                   | 6                                    | 12                                   | 6                                    | 3                                    | ...                                 | 3                  | 46     |
| Total . . . .        | 2                          | 15                                   | 38                                   | 27                                   | 33                                   | 27                                   | 5                                    | 3                                   | 5                  | 155    |
| Average . . . .      | 1                          | 5                                    | 13                                   | 9                                    | 11                                   | 9                                    | 2                                    | 1                                   | ...                | 52     |
| CARDIGAN . . . 1842  | 1                          | 2                                    | 4                                    | 3                                    | 2                                    | 1                                    | ...                                  | ...                                 | 1                  | 14     |
| 1843                 | 2                          | ...                                  | 3                                    | 5                                    | 5                                    | 1                                    | ...                                  | 3                                   | 3                  | 22     |
| 1844                 | ...                        | 2                                    | 10                                   | 9                                    | 1                                    | 2                                    | ...                                  | ...                                 | 1                  | 25     |
| Total . . . .        | 3                          | 4                                    | 17                                   | 17                                   | 8                                    | 4                                    | ...                                  | 3                                   | 5                  | 61     |
| Average . . . .      | 1                          | 1                                    | 6                                    | 6                                    | 3                                    | 1                                    | ...                                  | 1                                   | ...                | 20     |
| CARMARTHEN . . 1842  | 2                          | 5                                    | 7                                    | 3                                    | 10                                   | 5                                    | 2                                    | ...                                 | 8                  | 42     |
| 1843                 | 3                          | 13                                   | 24                                   | 10                                   | 17                                   | 15                                   | 3                                    | ...                                 | 76                 | 161    |
| 1844                 | 3                          | 6                                    | 24                                   | 15                                   | 18                                   | 7                                    | 5                                    | 2                                   | 12                 | 92     |
| Total . . . .        | 8                          | 24                                   | 55                                   | 28                                   | 45                                   | 27                                   | 10                                   | 2                                   | 96                 | 295    |
| Average . . . .      | 3                          | 8                                    | 18                                   | 9                                    | 15                                   | 9                                    | 3                                    | 1                                   | ...                | 98     |
| CARNARVON . . 1842   | ...                        | 4                                    | 7                                    | 6                                    | 5                                    | 2                                    | 1                                    | 1                                   | ...                | 26     |
| 1843                 | 2                          | ...                                  | 8                                    | 2                                    | 2                                    | 3                                    | ...                                  | 1                                   | 1                  | 19     |
| 1844                 | 1                          | 4                                    | 9                                    | 2                                    | 3                                    | ...                                  | 1                                    | 1                                   | 4                  | 25     |
| Total . . . .        | 3                          | 8                                    | 24                                   | 10                                   | 10                                   | 5                                    | 2                                    | 3                                   | 5                  | 70     |
| Average . . . .      | 1                          | 3                                    | 8                                    | 3                                    | 3                                    | 2                                    | 1                                    | 1                                   | ...                | 23     |
| DENBIGH . . . . 1842 | 3                          | 8                                    | 17                                   | 12                                   | 10                                   | 5                                    | ...                                  | 1                                   | 9                  | 65     |
| 1843                 | 2                          | 9                                    | 23                                   | 8                                    | 9                                    | 9                                    | 4                                    | 2                                   | 7                  | 73     |
| 1844                 | 9                          | 11                                   | 13                                   | 13                                   | 9                                    | 14                                   | 1                                    | 2                                   | 6                  | 78     |
| Total . . . .        | 14                         | 28                                   | 53                                   | 33                                   | 28                                   | 28                                   | 5                                    | 5                                   | 22                 | 216    |
| Average . . . .      | 5                          | 9                                    | 18                                   | 11                                   | 9                                    | 9                                    | 2                                    | 2                                   | ...                | 72     |
| FLINT . . . . . 1842 | 1                          | 7                                    | 12                                   | 4                                    | 12                                   | 4                                    | 1                                    | 2                                   | 6                  | 49     |
| 1843                 | ...                        | 7                                    | 8                                    | 4                                    | 15                                   | 7                                    | 1                                    | 1                                   | 3                  | 46     |
| 1844                 | 1                          | 5                                    | 8                                    | 7                                    | 14                                   | 2                                    | 1                                    | 1                                   | 3                  | 42     |
| Total . . . .        | 2                          | 19                                   | 28                                   | 15                                   | 41                                   | 13                                   | 3                                    | 4                                   | 12                 | 137    |
| Average . . . .      | 1                          | 6                                    | 9                                    | 5                                    | 14                                   | 4                                    | 1                                    | 1                                   | ...                | 46     |



TABLE VI.—(*continued.*)

|                |                 | Aged<br>under<br>15 years. | Aged<br>15 years<br>and<br>under 20. | Aged<br>20 years<br>and<br>under 25. | Aged<br>25 years<br>and<br>under 30. | Aged<br>30 years<br>and<br>under 40. | Aged<br>40 years<br>and<br>under 50. | Aged<br>50 years<br>and<br>under 60. | Aged<br>60 years<br>and<br>upwards. | Ages<br>not<br>known. | Total. |
|----------------|-----------------|----------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|-----------------------|--------|
| GLAMORGAN . .  | 1842            | 12                         | 29                                   | 31                                   | 28                                   | 25                                   | 12                                   | 4                                    | 3                                   | 9                     | 153    |
|                | 1843            | 5                          | 11                                   | 25                                   | 32                                   | 26                                   | 12                                   | 6                                    | 2                                   | 12                    | 131    |
|                | 1844            | 6                          | 32                                   | 40                                   | 25                                   | 28                                   | 15                                   | 7                                    | 2                                   | 13                    | 168    |
|                | Total . . . .   | 23                         | 72                                   | 96                                   | 85                                   | 79                                   | 39                                   | 17                                   | 7                                   | 34                    | 452    |
|                | Average . . . . | 8                          | 24                                   | 32                                   | 28                                   | 26                                   | 13                                   | 6                                    | 2                                   | ...                   | 151    |
| MERIONETH . .  | 1842            | 2                          | 1                                    | 4                                    | ...                                  | 1                                    | ...                                  | 2                                    | ...                                 | 1                     | 11     |
|                | 1843            | ...                        | 1                                    | 2                                    | 4                                    | 3                                    | 5                                    | 1                                    | 1                                   | ...                   | 17     |
|                | 1844            | 1                          | 1                                    | 1                                    | 2                                    | 1                                    | ...                                  | 1                                    | ...                                 | ...                   | 7      |
|                | Total . . . .   | 3                          | 3                                    | 7                                    | 6                                    | 5                                    | 5                                    | 4                                    | 1                                   | 1                     | 35     |
|                | Average . . . . | 1                          | 1                                    | 2                                    | 2                                    | 2                                    | 2                                    | 1                                    | ...                                 | ...                   | 12     |
| MONTGOMERY . . | 1842            | ...                        | 8                                    | 20                                   | 3                                    | 7                                    | 8                                    | 5                                    | 3                                   | 1                     | 55     |
|                | 1843            | 2                          | 16                                   | 18                                   | 10                                   | 13                                   | 5                                    | 7                                    | 2                                   | 2                     | 75     |
|                | 1844            | 1                          | 16                                   | 15                                   | 15                                   | 14                                   | 9                                    | 5                                    | 5                                   | ...                   | 80     |
|                | Total . . . .   | 3                          | 40                                   | 53                                   | 28                                   | 34                                   | 22                                   | 17                                   | 10                                  | 3                     | 210    |
|                | Average . . . . | 1                          | 13                                   | 18                                   | 9                                    | 11                                   | 7                                    | 6                                    | 3                                   | ...                   | 70     |
| PEMBROKE . .   | 1842            | ...                        | 5                                    | 10                                   | 3                                    | 3                                    | 3                                    | ...                                  | ...                                 | 2                     | 26     |
|                | 1843            | ...                        | 6                                    | 14                                   | 10                                   | 7                                    | 2                                    | 4                                    | ...                                 | 27                    | 70     |
|                | 1844            | 2                          | 6                                    | 9                                    | 6                                    | 7                                    | 4                                    | 5                                    | ...                                 | 2                     | 41     |
|                | Total . . . .   | 2                          | 17                                   | 33                                   | 19                                   | 17                                   | 9                                    | 9                                    | ...                                 | 31                    | 137    |
|                | Average . . . . | 1                          | 6                                    | 11                                   | 6                                    | 6                                    | 3                                    | 3                                    | ...                                 | ...                   | 46     |
| RADNOR . . .   | 1842            | ...                        | 3                                    | 3                                    | 3                                    | 6                                    | 4                                    | 1                                    | ...                                 | ...                   | 20     |
|                | 1843            | ...                        | 3                                    | 5                                    | 2                                    | 6                                    | 1                                    | 2                                    | 2                                   | 1                     | 22     |
|                | 1844            | 1                          | 5                                    | 4                                    | 3                                    | 5                                    | 4                                    | ...                                  | 1                                   | 2                     | 25     |
|                | Total . . . .   | 1                          | 11                                   | 12                                   | 8                                    | 17                                   | 9                                    | 3                                    | 3                                   | 3                     | 67     |
|                | Average . . . . | ...                        | 4                                    | 4                                    | 3                                    | 6                                    | 3                                    | 1                                    | 1                                   | ...                   | 22     |

from 10 per cent. to upwards of 11 per cent. It hence follows, that if even the tendency to crime were precisely the same at the respective terms of life in those districts, there would still be, in reference to the whole population, an apparent excess of crime in the three latter counties, from the fact that they contain a greater proportion of their population at that term of life at which the tendency to crime is the greatest; and, consequently, any method of investigating crime in which the element of age is not introduced, can never shew the relative amount of crime in different districts, nor in the same district at different periods of time.

[Still further to



TABLE VII.

*Amount of Crime in the following places, assuming the Ratio to be the same as that for England and Wales, during 1842, 1843, and 1844.*

*Males.*

| Age.             | England and Wales.<br>1841. | England and Wales.<br>1821. | Metropolis.<br>1841. | Glasgow.<br>1841. | United States, America.<br>Males and Females. | Ireland.                                                 |                                                           | Manchester, Birmingham, Leeds, and Sheffield. | Devon, Essex, Suffolk, Norfolk, and Hereford. | Bethnal Green. | St. George's, Hanover Square. | Middlesex. | Cornwall. |
|------------------|-----------------------------|-----------------------------|----------------------|-------------------|-----------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|----------------|-------------------------------|------------|-----------|
|                  |                             |                             |                      |                   |                                               | 4 Counties where the proportion of mud-hovels is lowest. | 4 Counties where the proportion of mud-hovels is highest. |                                               |                                               |                |                               |            |           |
| Under 15 .       | 1422                        | 1171                        | 140                  | 23                | 2                                             | 92                                                       | 181                                                       | 56                                            | 155                                           | 7              | 3                             | 118        | 33        |
| 15...20 .        | 5343                        | 3956                        | 541                  | 94                | 7                                             | 347                                                      | 683                                                       | 214                                           | 572                                           | 24             | 18                            | 456        | 120       |
| 20...25 .        | 5565                        | 3582                        | 691                  | 119               | 8                                             | 296                                                      | 576                                                       | 240                                           | 546                                           | 23             | 29                            | 584        | 106       |
| 25...30 .        | 3655                        | 2352                        | 493                  | 77                | 5                                             | 232                                                      | 478                                                       | 168                                           | 352                                           | 17             | 22                            | 417        | 67        |
| 30...40 .        | 3790                        | 2556                        | 513                  | 72                | 4                                             | 193                                                      | 377                                                       | 173                                           | 374                                           | 19             | 21                            | 431        | 71        |
| 40...50 .        | 1874                        | 1371                        | 243                  | 30                | 2                                             | 103                                                      | 167                                                       | 78                                            | 204                                           | 9              | 9                             | 206        | 37        |
| 50...60 .        | 841                         | 658                         | 97                   | 10                | ..                                            | 48                                                       | 89                                                        | 29                                            | 97                                            | 4              | 3                             | 82         | 17        |
| 60 & upwards     | 434                         | 349                         | 39                   | 4                 | ..                                            | 20                                                       | 26                                                        | 11                                            | 56                                            | 2              | 1                             | 32         | 9         |
| Total . .        | 22924                       | 15995                       | 2757                 | 429               | 28                                            | 1331                                                     | 2577                                                      | 969                                           | 2356                                          | 105            | 106                           | 2326       | 460       |
| Population .     | 7771094                     | 5845676                     | 876956               | 130478            | 10000                                         | 459728                                                   | 870058                                                    | 310869                                        | 832829                                        | 35552          | 29651                         | 733545     | 164295    |
| Proportion, 1 in | 339                         | 365                         | 314                  | 304               | 357                                           | 345                                                      | 338                                                       | 321                                           | 353                                           | 338            | 280                           | 315        | 357       |



TABLE VII.—(continued.)

| Age.             | Bedford.  | Berks.    | Bucks.           | Cambridge. | Cheshire.  | Cornwall.  | Cumber-<br>land. | Derby.     | Devon.    | Dorset.  | Durham.           | Essex.               | Gloucester. |
|------------------|-----------|-----------|------------------|------------|------------|------------|------------------|------------|-----------|----------|-------------------|----------------------|-------------|
| Under 15 . .     | 10        | 15        | 14               | 15         | 36         | 33         | 16               | 25         | 47        | 16       | 30                | 32                   | 37          |
| 15...20 . .      | 36        | 54        | 53               | 56         | 139        | 120        | 61               | 94         | 176       | 56       | 112               | 114                  | 138         |
| 20...25 . .      | 35        | 55        | 50               | 61         | 142        | 106        | 60               | 93         | 164       | 51       | 122               | 118                  | 141         |
| 25...30 . .      | 22        | 35        | 33               | 37         | 92         | 67         | 37               | 63         | 105       | 34       | 79                | 76                   | 93          |
| 30...40 . .      | 24        | 38        | 34               | 37         | 94         | 71         | 39               | 65         | 112       | 37       | 77                | 79                   | 98          |
| 40...50 . .      | 12        | 19        | 18               | 20         | 44         | 37         | 20               | 32         | 60        | 19       | 35                | 43                   | 51          |
| 50...60 . .      | 5         | 9         | 9                | 8          | 19         | 17         | 10               | 15         | 31        | 9        | 15                | 19                   | 23          |
| 60 & upwards .   | 3         | 5         | 5                | 4          | 9          | 9          | 5                | 8          | 17        | 6        | 8                 | 10                   | 12          |
| Total . . .      | 147       | 230       | 216              | 238        | 575        | 460        | 248              | 395        | 712       | 228      | 478               | 491                  | 593         |
| Population . .   | 52131     | 79596     | 76227            | 81331      | 192526     | 164295     | 85918            | 135223     | 252049    | 83459    | 159702            | 171310               | 204330      |
| Proportion, 1 in | 355       | 346       | 353              | 342        | 334        | 357        | 346              | 342        | 354       | 366      | 334               | 348                  | 344         |
| Ages.            | Hereford. | Hertford. | Hunting-<br>don. | Kent.      | Lancaster. | Leicester. | Lincoln.         | Middlesex. | Monmouth. | Norfolk. | Northamp-<br>ton. | Northum-<br>berland. | Notts.      |
| Under 15 . .     | 10        | 15        | 5                | 49         | 150        | 19         | 33               | 118        | 12        | 37       | 18                | 22                   | 23          |
| 15...20 . .      | 38        | 54        | 21               | 183        | 582        | 74         | 125              | 456        | 47        | 138      | 70                | 84                   | 81          |
| 20...25 . .      | 37        | 53        | 21               | 198        | 624        | 70         | 129              | 584        | 61        | 128      | 69                | 90                   | 79          |
| 25...30 . .      | 25        | 34        | 13               | 118        | 416        | 46         | 82               | 417        | 40        | 81       | 43                | 58                   | 53          |
| 30...40 . .      | 27        | 36        | 13               | 127        | 432        | 49         | 83               | 431        | 38        | 89       | 46                | 59                   | 59          |
| 40...50 . .      | 15        | 18        | 7                | 63         | 189        | 26         | 44               | 206        | 17        | 50       | 24                | 28                   | 30          |
| 50...60 . .      | 7         | 8         | 3                | 31         | 76         | 12         | 20               | 82         | 7         | 22       | 11                | 13                   | 14          |
| 60 & upwards .   | 4         | 5         | 2                | 18         | 32         | 7          | 11               | 32         | 3         | 14       | 6                 | 7                    | 7           |
| Total . . .      | 163       | 223       | 85               | 787        | 2501       | 303        | 527              | 2326       | 225       | 559      | 287               | 361                  | 346         |
| Population . .   | 56866     | 77120     | 28945            | 269484     | 813077     | 105477     | 180466           | 733545     | 70467     | 198772   | 98662             | 120872               | 121381      |
| Proportion, 1 in | 349       | 346       | 341              | 342        | 325        | 348        | 342              | 315        | 313       | 356      | 344               | 335                  | 351         |



TABLE VII.—(continued.)

| Age.             | Oxford. | Rutland. | Salop. | Somerset. | Southamp-<br>ton. | Stafford. | Suffolk. | Surrey. | Sussex. | Warwick. | Westmore-<br>land. | Wilts. | Worcester. |
|------------------|---------|----------|--------|-----------|-------------------|-----------|----------|---------|---------|----------|--------------------|--------|------------|
| Under 15 . . .   | 15      | 2        | 21     | 39        | 32                | 49        | 29       | 49      | 28      | 35       | 5                  | 24     | 21         |
| 15...20 . . .    | 55      | 8        | 84     | 148       | 119               | 179       | 106      | 171     | 96      | 131      | 21                 | 91     | 75         |
| 20...25 . . .    | 57      | 7        | 82     | 178       | 125               | 190       | 100      | 196     | 96      | 142      | 20                 | 88     | 78         |
| 25...30 . . .    | 34      | 4        | 54     | 90        | 79                | 129       | 63       | 138     | 62      | 96       | 12                 | 53     | 52         |
| 30...40 . . .    | 36      | 5        | 56     | 95        | 79                | 126       | 68       | 148     | 68      | 98       | 12                 | 56     | 55         |
| 40...50 . . .    | 19      | 3        | 29     | 51        | 41                | 58        | 36       | 73      | 35      | 48       | 7                  | 31     | 28         |
| 50...60 . . .    | 9       | 1        | 14     | 24        | 21                | 25        | 17       | 31      | 16      | 20       | 3                  | 14     | 12         |
| 60 & upwards .   | 5       | 0        | 8      | 14        | 11                | 12        | 11       | 14      | 9       | 10       | 2                  | 9      | 7          |
| Total . . .      | 230     | 30       | 348    | 639       | 507               | 768       | 430      | 820     | 410     | 580      | 82                 | 366    | 328        |
| Population . .   | 80176   | 10659    | 119037 | 208918    | 174344            | 257586    | 153832   | 275207  | 146552  | 194782   | 28074              | 127454 | 114249     |
| Proportion, 1 in | 348     | 355      | 342    | 327       | 344               | 335       | 358      | 336     | 357     | 335      | 342                | 348    | 348        |

| Age.             | York.  | Anglesea. | Brecon. | Cardigan. | Carmarthen. | Carnarvon. | Denbigh. | Flint. | Glamorgan. | Merioneth. | Mont-<br>gomery. | Pembroke. | Radnor. |
|------------------|--------|-----------|---------|-----------|-------------|------------|----------|--------|------------|------------|------------------|-----------|---------|
| Under 15 . . .   | 147    | 5         | 5       | 6         | 10          | 7          | 8        | 6      | 15         | 3          | 6                | 8         | 2       |
| 15...20 . . .    | 565    | 16        | 19      | 23        | 36          | 27         | 32       | 25     | 60         | 12         | 24               | 28        | 9       |
| 20...25 . . .    | 570    | 15        | 21      | 20        | 31          | 27         | 30       | 24     | 73         | 12         | 22               | 24        | 9       |
| 25...30 . . .    | 371    | 0         | 14      | 13        | 20          | 19         | 19       | 15     | 48         | 9          | 14               | 16        | 5       |
| 30...40 . . .    | 371    | 10        | 14      | 14        | 22          | 19         | 20       | 16     | 47         | 9          | 15               | 17        | 5       |
| 40...50 . . .    | 181    | 6         | 6       | 7         | 11          | 9          | 10       | 8      | 19         | 4          | 8                | 9         | 3       |
| 50...60 . . .    | 83     | 3         | 3       | 4         | 6           | 4          | 5        | 4      | 8          | 2          | 4                | 4         | 2       |
| 60 & upwards .   | 41     | 2         | 2       | 2         | 3           | 2          | 3        | 2      | 4          | 1          | 2                | 3         | 1       |
| Total . . .      | 2329   | 57        | 84      | 89        | 139         | 114        | 127      | 100    | 274        | 52         | 95               | 109       | 36      |
| Population . .   | 785409 | 24293     | 28023   | 32183     | 50567       | 39437      | 44373    | 33456  | 87414      | 19262      | 34245            | 40119     | 12804   |
| Proportion, 1 in | 337    | 363       | 334     | 362       | 363         | 346        | 349      | 335    | 319        | 370        | 360              | 368       | 355     |



Still further to establish this truth, Table VII has been constructed on the hypothesis, that in the various counties and districts the tendency to crime was the same as prevailed in England and Wales during the years 1842, 1843, and 1844, as represented in Table I. The actual populations of those places were taken as given in Table III. In Table I it will be seen that the actual proportion of male criminals in England and Wales during those three years was one in every 336 of the whole male population. If the population of the kingdom, however, during those years, had been under the same distribution in regard to age as in the year 1821, the proportion of criminals would have been one in every 365 only of the population; but, on the other hand, if under the same distribution as the city of Glasgow, crime would appear to have been as high as one in every 304. Again, the difference of distribution of even two districts in the metropolis is such as to produce in Bethnal Green the proportion of one in 338, while in St. George's, Hanover Square, the ratio would be as high as one in 280; shewing a difference or error in the method of inquiry thus resorted to, of about 21 per cent. An inspection of the results for the several counties will furnish evidence of similar irregularities. In Anglesea, Cardigan, Carmarthen, Dorset, Merioneth, Montgomery, and Pembroke, the ratio of crime is one in 360 and upwards; but in Glamorgan, Lancaster, Middlesex, and Monmouth, the average is from one in 325 to one in 313, being a difference of at least 18 per cent. It is therefore evident that the element of age is an essential item in every inquiry or investigation into the relative amount and progress of crime in different districts, and that calculations in which that element is neglected cannot be relied on; for we have here examples of districts in which the same ratio of crime is assumed to prevail, and yet there would appear to be an excess of crime in some places of 20 per cent. above that which would seem to prevail in others.

The arguments and illustrations now brought forward to shew the necessity of viewing age as an element in all inquiries into the prevalence of crime, it will be seen, apply with equal force to the question of sex.

Over the whole male population of the country, the tendency to crime is nearly five times as great as in the female sex; and since in some districts of the country the proportion of the population of the two sexes at the various periods of life is very different, the results of any inquiry in which the sexes are not distinguished must be subject to very great fallacies, shewing errors to a greater extent than even those connected with the element of age, as that element would equally affect the present case, and be further vitiated by the disturbing influence of sex. It is therefore obvious, that in every properly conducted inquiry in criminal statistics, a separate analysis must be made for each sex.

Some very curious and interesting features will be found to connect themselves with Tables I and II, and also Tables XXII and XXIII. From the age of 20 it will be found that in the male sex, crime, in each successive term of life given in the Tables, decreases



at the rate of 33·333 per cent., and in the female sex, at the rate of 25 per cent. ; so that if two Tables were formed, in one of which the numbers resulting from such a law were given, and in the other the actual number of criminals, the one Table, particularly in reference to the female sex, would be almost identical with the other. The following Abstract will shew the ratio of criminals according to the actual results for England and Wales during the years 1842-4, and also during the years 1845-8, as well as according to the theoretical law just alluded to ; and in regard to the years 1842-4, it will be seen that in only one of the terms of the male sex is there any material difference between the two classes of results, while for the female sex, the actual and the theoretical results are almost identical throughout the whole of the Table.

*Proportion per cent. of Crime to the Population.*

| Age.      | Males.                                |         |         |         | Females.                                |         |         |         |
|-----------|---------------------------------------|---------|---------|---------|-----------------------------------------|---------|---------|---------|
|           | Actual Results.<br>Tables I and XXII. |         | Law.    |         | Actual Results.<br>Tables II and XXIII. |         | Law.    |         |
|           | 1842-4.                               | 1845-8. | 1842-4. | 1845-8. | 1842-4.                                 | 1845-8. | 1842-4. | 1845-8. |
| 20 to 25  | ·7702                                 | ·6702   | ·8536   | ·7290   | ·1459                                   | ·1506   | ·1452   | ·1497   |
| 25 ... 30 | ·5989                                 | ·5141   | ·5691   | ·4860   | ·1141                                   | ·1240   | ·1089   | ·1123   |
| 30 ... 40 | ·3794                                 | ·3240   | ·3794   | ·3240   | ·0817                                   | ·0842   | ·0817   | ·0842   |
| 40 ... 50 | ·2504                                 | ·2222   | ·2529   | ·2160   | ·0643                                   | ·0609   | ·0613   | ·0632   |
| 50 ... 60 | ·1694                                 | ·1334   | ·1686   | ·1440   | ·0466                                   | ·0385   | ·0460   | ·0474   |

In statistical inquiries the discovery of any such law as that now pointed out is of the first importance, for it gives evidence of the existence of some very powerful and intense element connected with the determination of the particular class of results, and but little influenced or disturbed by external circumstances ; which, if once clearly exhibited, may admit of such modifications in its conditions as will lead to practical and highly beneficial modes of administration, tending to elevate the moral and political condition of the people. It is only from a properly determined series of results, developing general principles in the truth and safety of which confidence can be placed, that any effective legislation can result ; and without the appearance of some numerical laws, those principles themselves must remain comparatively obscure, and legislation continue impeded. It will be found that this theoretical law is not peculiar to the periods of years to which the preceding facts relate, but is a proper and distinctive feature in the conditions of society under which crime appears in other years. The preceding Abstract has relation to the years 1842-8 only, because prior to the year 1842, the Criminal Returns published by the Home Office gave the ages of criminals for a division of ages which could not be assimilated with the periods of life recognised in the census ; and to have introduced them would only have lessened the value of the facts now presented ; but from the following Abstract it will be seen, that so far as the Criminal Returns for the four years 1838-1841 go, traces of the same law of crime are clearly observable.



| Age.         | Males. |       |       |       |        | Mean of<br>4 years. | Per cent. to whole<br>Population of |          | Mean of<br>4 years. | Females. |       |       |       |       |
|--------------|--------|-------|-------|-------|--------|---------------------|-------------------------------------|----------|---------------------|----------|-------|-------|-------|-------|
|              | 1838.  | 1839. | 1840. | 1841. | Total. |                     | Males.                              | Females. |                     | Total.   | 1841. | 1840. | 1839. | 1838. |
| Under 12 .   | 317    | 363   | 409   | 416   | 1505   | 376                 | ...                                 | ...      | 68                  | 272      | 82    | 80    | 61    | 49    |
| 12...16 .    | 1933   | 2062  | 2177  | 2240  | 8412   | 2103                | ...                                 | ...      | 428                 | 1711     | 474   | 477   | 402   | 358   |
| 16...21 .    | 5562   | 5602  | 6239  | 6188  | 23591  | 5898                | ·7587                               | ·1621    | 1303                | 5212     | 1385  | 1403  | 1259  | 1165  |
| 21...30 .    | 5935   | 6184  | 6815  | 7286  | 26220  | 6555                | ·4939                               | ·0992    | 1484                | 5935     | 1625  | 1609  | 1421  | 1280  |
| 30...40 .    | 2733   | 2935  | 3366  | 3413  | 12447  | 3112                | ·3129                               | ·0723    | 759                 | 3038     | 849   | 800   | 716   | 673   |
| 40...50 .    | 1226   | 1300  | 1495  | 1543  | 5564   | 1391                | ·1867                               | ·0551    | 428                 | 1714     | 451   | 465   | 402   | 396   |
| 50...60 .    | 545    | 612   | 656   | 656   | 2469   | 617                 | ·1249                               | ·0331    | 175                 | 700      | 175   | 194   | 185   | 146   |
| 60 & upwards | 289    | 298   | 342   | 332   | 1261   | 315                 | ...                                 | ...      | 83                  | 331      | 86    | 87    | 81    | 77    |
| Unknown .    | 365    | 475   | 476   | 486   | 1802   | 450                 | ...                                 | ...      | 75                  | 300      | 73    | 97    | 85    | 45    |

It must thus appear evident that whatever means may be employed for the prevention of crime, or the treatment of criminals, ought to shew their influence and bearing on the male sex chiefly between the ages of 20 and 25. The following Abstract from Tables I and II and XXII and XXIII will shew the relative tendency to crime in the two sexes at the various terms of life.

| Age.         | Ratio per cent. of Criminals to the Population, yearly. |         |          |         | Number of the Population to which there is one crime yearly. |         |          |         | Excess per cent. of Crime among Males. |         |
|--------------|---------------------------------------------------------|---------|----------|---------|--------------------------------------------------------------|---------|----------|---------|----------------------------------------|---------|
|              | Males.                                                  |         | Females. |         | Males.                                                       |         | Females. |         |                                        |         |
|              | 1842-4.                                                 | 1845-8. | 1842-4.  | 1845-8. | 1842-4.                                                      | 1845-8. | 1842-4.  | 1845-8. | 1842-4.                                | 1845-8. |
| Under 15 .   | ·0494                                                   | ·0432   | ·0080    | ·0072   | 2024·7                                                       | 2315·2  | 12500·0  | 13913·3 | 517·4                                  | 500·9   |
| 15...20 .    | ·6841                                                   | ·6404   | ·1495    | ·1498   | 146·2                                                        | 156·1   | 668·9    | 667·7   | 357·5                                  | 327·7   |
| 20...25 .    | ·7702                                                   | ·6702   | ·1459    | ·1506   | 129·8                                                        | 149·2   | 770·4    | 664·1   | 493·5                                  | 345·1   |
| 25...30 .    | ·5989                                                   | ·5141   | ·1141    | ·1240   | 167·0                                                        | 194·5   | 876·4    | 806·4   | 424·8                                  | 314·6   |
| 30...40 .    | ·3794                                                   | ·3240   | ·0817    | ·0842   | 263·6                                                        | 308·6   | 1224·0   | 1188·2  | 364·3                                  | 285·0   |
| 40...50 .    | ·2504                                                   | ·2222   | ·0643    | ·0609   | 399·4                                                        | 450·0   | 1555·2   | 1160·9  | 289·4                                  | 158·0   |
| 50...60 .    | ·1694                                                   | ·1334   | ·0466    | ·0385   | 590·3                                                        | 749·8   | 2145·9   | 2596·9  | 263·5                                  | 246·3   |
| 60 & upwards | ·0813                                                   | ·0688   | ·0186    | ·0157   | 1230·0                                                       | 145·4   | 5373·5   | 6379·3  | 336·8                                  | 428·7   |

It will be observed that in the male sex the tendency to crime at ages 15-20 is somewhat less than in the next quinquennial period of life; but a similar result does not appear for the female sex during the period 1842-4, as the tendency to crime at those two periods of life is nearly equal. In the Home Office Returns the ages of the offenders under 15 years is not distinguished; but if the age of criminals under 15 be held to be between the ages of 10-15, it will alter the expressions at that term of life in Tables I and II, and in the corresponding columns of the above Abstract from ·0494 per cent. to ·1607 per cent. for the male sex, and from ·0080 per cent. to ·0266 per cent. for the female sex, and a similar modification will be necessary in respect to the results derived from Tables XXII and XXIII.



In Table VI preceding is given the number of criminal offenders in each county of England and Wales, at the respective terms of life recognised in the Home Office Returns, for each of the years 1842, 1843, and 1844; also the total number of criminals in the various counties, at each term of life for the three years, as well as the average number for the three years.

The next Table to which attention is directed (Table VIII) is one of some importance, as it shews the actual yearly average number of criminals in each county of England and Wales, during the years 1842, 1843, and 1844, and for every term of life. In a parallel column is given what would have been the number of criminals at the same terms of life, provided the same tendency to crime had prevailed in each county as over the whole kingdom. A comparison of the parallel columns will at once shew, whether the actual crime in any county be above or below the average of the whole kingdom, and also at what term of life the increase or decrease of crime prevails. A further analysis of the same facts will be found in Table XI, in which a correction is applied for the increase of population to the mean times of the years 1842, 1843, and 1844; and in the last column of that Table will be found the difference per cent. between the actual amount of crime in each county, and that which would have resulted if the same tendency to crime had prevailed as over the whole of England and Wales.

Having thus found the actual amount of crime in each county, in relation to the ages of the population, as well as the average crime in each county at the same ages, according to the ratio for the whole kingdom, and observed the marked differences in the amount of crime in various districts,—some having an excess of crime of more than 52 per cent. above the average of the country, while other districts are below the average by at least 80 per cent.;—it becomes an important problem for solution, to discover, if possible, the nature and character of that element in the condition of the respective districts which produces so remarkable a disparity, and exercises so powerful an influence in the development of crime.

Various methods suggest themselves of effecting such an analysis as might possibly lead to the discovery of any agent, so materially influencing the moral and social state of society. The first arrangement adopted is that supposed to connect itself with the manufacturing or agricultural interest of a district. In Table IX the manufacturing and mining counties are divided into four groups,—the northern mining districts; the cotton and woollen manufacturing districts; the cotton, woollen, silk, and lace-fabric districts; and the hardware, pottery, and glass manufacturing districts. Again, the agricultural counties will be found to be divided into three groups,—the North-Eastern and Eastern, the Midland, and the South and South-Western districts. In each of these combinations the actual number of criminals at the respective periods of life is shewn, as well as the number that would result in those districts at the same ages, if the same tendency to crime prevailed as over the whole of the kingdom.

In Table XII the same facts will be found under a more convenient arrangement.

[The first



TABLE VIII.

*Shewing the actual amount of Crime in each County, according to the average of the years 1842, 1843, and 1844; and also the calculated amount supposing the ratio to be the same as that for the whole of England and Wales during the same years.—Males.*

| AGE.             | BEDFORD.    |         | BERKS.      |         | BUCKS.      |         | CAMBRIDGE.  |         | CHESHIRE.   |         | CORNWALL.   |         | CUMBERLAND. |         |
|------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
|                  | Number.     |         | Number.     |         | Number.     |         | Number.     |         | Number.     |         | Number.     |         | Number.     |         |
|                  | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. |
| Under 15 . . .   | 10          | 9       | 15          | 12      | 14          | 10      | 15          | 11      | 36          | 61      | 33          | 16      | 16          | 4       |
| 15...20 . . .    | 36          | 38      | 54          | 58      | 53          | 60      | 56          | 47      | 139         | 160     | 120         | 48      | 61          | 12      |
| 20...25 . . .    | 35          | 47      | 55          | 65      | 50          | 69      | 61          | 66      | 142         | 181     | 106         | 50      | 60          | 14      |
| 25...30 . . .    | 22          | 29      | 35          | 34      | 33          | 42      | 37          | 37      | 92          | 122     | 67          | 34      | 37          | 14      |
| 30...40 . . .    | 24          | 31      | 38          | 46      | 34          | 48      | 37          | 36      | 94          | 139     | 71          | 35      | 39          | 16      |
| 40...50 . . .    | 12          | 19      | 19          | 25      | 18          | 20      | 20          | 20      | 44          | 72      | 37          | 19      | 20          | 11      |
| 50...60 . . .    | 5           | 7       | 9           | 12      | 9           | 9       | 8           | 10      | 19          | 37      | 17          | 8       | 10          | 6       |
| 60 and upwards   | 3           | 4       | 5           | 5       | 5           | 5       | 4           | 1       | 9           | 20      | 9           | 5       | 5           | 4       |
| Total . . .      | 147         | 184     | 230         | 257     | 216         | 263     | 238         | 228     | 557         | 792     | 460         | 215     | 248         | 81      |
| Population . . . | 52131       | ...     | 79596       | ...     | 76227       | ...     | 81331       | ...     | 192526      | ...     | 164295      | ...     | 85918       | ...     |
| Proportion;—1 in | 355         | 283     | 346         | 317     | 353         | 290     | 342         | 357     | 334         | 243     | 357         | 764     | 346         | 1061    |

|                  | DERBY.      |         | DEVON.      |         | DORSET.     |         | DURHAM.     |         | ESSEX.      |         | GLOUCESTER. |         | HEREFORD.   |         |
|------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
|                  | Number.     |         | Number.     |         | Number.     |         | Number.     |         | Number.     |         | Number.     |         | Number.     |         |
|                  | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. |
| Under 15 . . .   | 25          | 8       | 47          | 25      | 16          | 7       | 30          | 12      | 32          | 30      | 37          | 89      | 10          | 6       |
| 15...20 . . .    | 94          | 40      | 176         | 110     | 56          | 39      | 112         | 50      | 114         | 145     | 138         | 255     | 38          | 30      |
| 20...25 . . .    | 93          | 70      | 164         | 135     | 51          | 45      | 122         | 63      | 118         | 151     | 141         | 213     | 37          | 53      |
| 25...30 . . .    | 63          | 50      | 105         | 96      | 34          | 26      | 79          | 47      | 76          | 85      | 93          | 119     | 25          | 43      |
| 30...40 . . .    | 65          | 57      | 112         | 95      | 37          | 36      | 77          | 42      | 79          | 99      | 98          | 136     | 27          | 35      |
| 40...50 . . .    | 32          | 26      | 60          | 52      | 19          | 14      | 35          | 23      | 43          | 48      | 51          | 69      | 15          | 16      |
| 50...60 . . .    | 15          | 12      | 31          | 23      | 9           | 7       | 15          | 7       | 19          | 20      | 23          | 35      | 7           | 8       |
| 60 and upwards   | 8           | 7       | 17          | 11      | 6           | 9       | 8           | 4       | 10          | 11      | 12          | 16      | 4           | 6       |
| Total . . .      | 395         | 270     | 712         | 547     | 228         | 183     | 478         | 248     | 491         | 589     | 593         | 932     | 163         | 197     |
| Population . . . | 135223      | ...     | 252049      | ...     | 83459       | ...     | 171310      | ...     | 171310      | ...     | 204330      | ...     | 56866       | ...     |
| Proportion;—1 in | 342         | 501     | 354         | 461     | 366         | 456     | 334         | 644     | 348         | 291     | 344         | 219     | 349         | 290     |



TABLE VIII—(continued).

| AGE.             | HERTFORD.   |         | HUNTS.      |         | KENT.        |         | LANCASTER.      |         | LEICESTER.  |         | LINCOLN.    |         | MIDDLESEX.  |         |
|------------------|-------------|---------|-------------|---------|--------------|---------|-----------------|---------|-------------|---------|-------------|---------|-------------|---------|
|                  | Calculated. | Actual. | Calculated. | Actual. | Calculated.  | Actual. | Calculated.     | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. |
| Under 15 . . .   | 15          | 10      | 5           | 2       | 49           | 35      | 150             | 185     | 19          | 25      | 33          | 11      | 118         | 262     |
| 15...20 . . .    | 54          | 51      | 21          | 12      | 183          | 192     | 582             | 637     | 74          | 105     | 125         | 75      | 456         | 913     |
| 20...25 . . .    | 53          | 72      | 21          | 16      | 198          | 220     | 624             | 672     | 70          | 107     | 129         | 129     | 584         | 710     |
| 25...30 . . .    | 34          | 39      | 13          | 12      | 118          | 131     | 416             | 448     | 46          | 66      | 83          | 81      | 417         | 380     |
| 30...40 . . .    | 36          | 50      | 13          | 10      | 127          | 135     | 432             | 502     | 49          | 75      | 83          | 81      | 431         | 422     |
| 40...50 . . .    | 18          | 23      | 7           | 4       | 63           | 73      | 189             | 242     | 26          | 30      | 44          | 37      | 206         | 227     |
| 50...60 . . .    | 8           | 8       | 3           | 1       | 31           | 30      | 76              | 82      | 12          | 11      | 20          | 14      | 82          | 100     |
| 60 & upwards.    | 5           | 5       | 2           | 1       | 18           | 19      | 32              | 34      | 7           | 12      | 11          | 5       | 32          | 42      |
| Total . . .      | 223         | 258     | 85          | 58      | 787          | 835     | 2501            | 2802    | 303         | 431     | 527         | 433     | 2326        | 3056    |
| Population . . . | 77120       | ...     | 28945       | ...     | 269484       | ...     | 813077          | ...     | 105477      | ...     | 180466      | ...     | 733545      | ...     |
| Proportion;—1 in | 346         | 299     | 345         | 499     | 342          | 323     | 325             | 290     | 348         | 245     | 342         | 417     | 315         | 240     |
|                  | MONMOUTH.   |         | NORFOLK.    |         | NORTHAMPTON. |         | NORTHUMBERLAND. |         | NOTTS.      |         | OXFORD.     |         | RUTLAND.    |         |
|                  | Calculated. | Actual. | Calculated. | Actual. | Calculated.  | Actual. | Calculated.     | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. |
| Under 15 . . .   | 12          | 6       | 37          | 54      | 18           | 11      | 22              | 22      | 23          | 19      | 15          | 15      | 2           | 1       |
| 15...20 . . .    | 47          | 34      | 138         | 176     | 70           | 46      | 84              | 49      | 81          | 69      | 55          | 48      | 8           | 3       |
| 20...25 . . .    | 61          | 51      | 128         | 164     | 69           | 75      | 90              | 49      | 79          | 88      | 57          | 70      | 7           | 11      |
| 25...30 . . .    | 40          | 37      | 81          | 89      | 43           | 45      | 58              | 26      | 53          | 41      | 34          | 45      | 4           | 5       |
| 30...40 . . .    | 38          | 44      | 89          | 92      | 46           | 43      | 59              | 30      | 59          | 50      | 36          | 49      | 5           | 7       |
| 40...50 . . .    | 17          | 16      | 50          | 45      | 24           | 24      | 28              | 13      | 30          | 27      | 19          | 22      | 3           | 3       |
| 50...60 . . .    | 7           | 8       | 22          | 25      | 11           | 11      | 13              | 6       | 14          | 10      | 9           | 9       | 1           | 1       |
| 60 & upwards .   | 3           | 5       | 14          | 16      | 6            | 6       | 7               | 2       | 7           | 3       | 5           | 7       | ...         | ...     |
| Total . . .      | 225         | 201     | 559         | 661     | 287          | 261     | 361             | 197     | 346         | 307     | 230         | 265     | 30          | 31      |
| Population . . . | 70467       | ...     | 198772      | ...     | 98662        | ...     | 120872          | ...     | 121381      | ...     | 80176       | ...     | 10959       | ...     |
| Proportion;—1 in | 313         | 351     | 356         | 301     | 344          | 378     | 335             | 614     | 351         | 395     | 348         | 302     | 855         | 344     |



TABLE VIII—(continued.)

| AGE.             | SALOP.      |                    | SOMERSET.   |                    | SOUTHAMPTON.  |                    | STAFFORD.   |                    | SUFFOLK.    |                    | SURREY.     |                    |
|------------------|-------------|--------------------|-------------|--------------------|---------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|
|                  | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated.   | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. |
| Under 15 . . .   | 21          | 19                 | 39          | 50                 | 32            | 26                 | 49          | 49                 | 29          | 26                 | 49          | 44                 |
| 15...20 . . .    | 84          | 74                 | 148         | 220                | 119           | 104                | 179         | 176                | 106         | 116                | 171         | 195                |
| 20...25 . . .    | 82          | 93                 | 178         | 224                | 125           | 140                | 190         | 256                | 100         | 141                | 196         | 192                |
| 25...30 . . .    | 54          | 63                 | 90          | 128                | 79            | 83                 | 129         | 168                | 63          | 71                 | 138         | 110                |
| 30...40 . . .    | 56          | 76                 | 95          | 116                | 79            | 78                 | 126         | 180                | 68          | 75                 | 148         | 97                 |
| 40...50 . . .    | 29          | 40                 | 51          | 55                 | 41            | 42                 | 58          | 77                 | 36          | 34                 | 73          | 48                 |
| 50...60 . . .    | 14          | 21                 | 24          | 30                 | 21            | 25                 | 25          | 38                 | 17          | 17                 | 31          | 30                 |
| 60 & upwards . . | 8           | 13                 | 14          | 20                 | 11            | 12                 | 12          | 18                 | 11          | 12                 | 14          | 12                 |
| Total . . .      | 348         | 399                | 639         | 843                | 507           | 510                | 768         | 962                | 430         | 492                | 820         | 728                |
| Population . . . | 119037      | ...                | 208918      | ...                | 174344        | ...                | 257586      | ...                | 153832      | ...                | 275207      | ...                |
| Proportion;—1 in | 342         | 298                | 327         | 248                | 344           | 342                | 335         | 268                | 358         | 313                | 336         | 378                |
|                  | SUSSEX.     |                    | WARWICK.    |                    | WESTMORELAND. |                    | WILTS.      |                    | WORCESTER.  |                    | YORK.       |                    |
|                  | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated.   | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. |
| Under 15 . . .   | 28          | 24                 | 35          | 63                 | 5             | 1                  | 24          | 20                 | 21          | 28                 | 147         | 86                 |
| 15...20 . . .    | 96          | 92                 | 131         | 226                | 21            | 4                  | 91          | 100                | 75          | 116                | 565         | 371                |
| 20...25 . . .    | 96          | 97                 | 142         | 200                | 20            | 8                  | 88          | 108                | 78          | 134                | 570         | 485                |
| 25...30 . . .    | 62          | 54                 | 96          | 111                | 12            | 6                  | 53          | 56                 | 52          | 84                 | 371         | 337                |
| 30...40 . . .    | 68          | 72                 | 98          | 131                | 12            | 4                  | 56          | 73                 | 55          | 86                 | 371         | 317                |
| 40...50 . . .    | 35          | 37                 | 48          | 61                 | 7             | 2                  | 31          | 33                 | 28          | 42                 | 181         | 134                |
| 50...60 . . .    | 16          | 18                 | 20          | 21                 | 3             | 1                  | 14          | 19                 | 12          | 20                 | 83          | 60                 |
| 60 & upwards . . | 9           | 11                 | 10          | 12                 | 2             | 1                  | 9           | 8                  | 7           | 6                  | 41          | 28                 |
| Total . . .      | 410         | 405                | 580         | 825                | 82            | 27                 | 366         | 417                | 328         | 516                | 2329        | 1818               |
| Population . . . | 146552      | ...                | 194782      | ...                | 28074         | ...                | 127454      | ...                | 114249      | ...                | 785409      | ...                |
| Proportion;—1 in | 357         | 362                | 335         | 236                | 342           | 1040               | 348         | 306                | 348         | 221                | 337         | 432                |



TABLE VIII—(continued.)

| Age.              | ANGLESEA.   |                    | BRECON.     |                    | CARDIGAN.   |                    | CARMARTHEN. |                    | CARNARVON.  |                    | DENBIGH.    |                    |
|-------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|
|                   | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. |
| Under 15.         | 5           | ...                | 5           | 1                  | 6           | 1                  | 10          | 3                  | 7           | 1                  | 8           | 5                  |
| 15...20.          | 16          | 2                  | 19          | 5                  | 23          | 1                  | 36          | 8                  | 27          | 3                  | 32          | 9                  |
| 20...25.          | 15          | 2                  | 21          | 13                 | 20          | 6                  | 31          | 18                 | 27          | 8                  | 30          | 18                 |
| 25...30.          | 10          | 1                  | 14          | 9                  | 13          | 6                  | 20          | 9                  | 19          | 3                  | 19          | 11                 |
| 30...40.          | 10          | 3                  | 14          | 11                 | 14          | 3                  | 22          | 15                 | 19          | 3                  | 20          | 9                  |
| 40...50.          | 6           | 1                  | 6           | 9                  | 7           | 1                  | 11          | 9                  | 9           | 2                  | 10          | 9                  |
| 50...60.          | 3           | 1                  | 3           | 2                  | 4           | ...                | 6           | 3                  | 4           | 1                  | 5           | 2                  |
| 60 & upwards.     | 2           | ...                | 2           | 1                  | 2           | 1                  | 3           | 1                  | 2           | 1                  | 3           | 2                  |
| Total . . .       | 67          | 10                 | 84          | 51                 | 89          | 19                 | 139         | 66                 | 114         | 22                 | 127         | 65                 |
| Population . . .  | 24293       | ...                | 28023       | ...                | 32183       | ...                | 50567       | ...                | 39437       | ...                | 44373       | ...                |
| Proportion ;—1 in | 363         | 2429               | 334         | 549                | 362         | 1694               | 363         | 766                | 346         | 1656               | 349         | 683                |
|                   |             |                    |             |                    |             |                    |             |                    |             |                    |             |                    |
|                   | FLINT.      |                    | GLAMORGAN.  |                    | MERIONETH.  |                    | MONTGOMERY. |                    | PEMBROKE.   |                    | RADNOR.     |                    |
|                   | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. |
| Under 15.         | 6           | 1                  | 15          | 8                  | 3           | 1                  | 6           | 1                  | 8           | 1                  | 2           | ...                |
| 15...20.          | 25          | 6                  | 60          | 24                 | 12          | 1                  | 24          | 13                 | 28          | 6                  | 9           | 4                  |
| 20...25.          | 24          | 9                  | 73          | 32                 | 12          | 2                  | 22          | 18                 | 24          | 11                 | 9           | 4                  |
| 25...30.          | 15          | 5                  | 48          | 28                 | 9           | 2                  | 14          | 9                  | 16          | 6                  | 5           | 3                  |
| 30...40.          | 16          | 14                 | 47          | 26                 | 9           | 2                  | 15          | 11                 | 17          | 6                  | 5           | 6                  |
| 40...50.          | 8           | 4                  | 19          | 13                 | 4           | 2                  | 8           | 7                  | 9           | 3                  | 3           | 3                  |
| 50...60.          | 4           | 1                  | 8           | 6                  | 2           | 1                  | 4           | 6                  | 4           | 3                  | 2           | 1                  |
| 60 & upwards.     | 2           | 1                  | 4           | 2                  | 1           | ...                | 2           | 3                  | 3           | ...                | 1           | 1                  |
| Total . . .       | 100         | 41                 | 274         | 139                | 52          | 11                 | 95          | 68                 | 109         | 36                 | 36          | 22                 |
| Population . . .  | 33456       | ...                | 87414       | ...                | 19262       | ...                | 34245       | ...                | 40119       | ...                | 12804       | ...                |
| Proportion ;—1 in | 335         | 816                | 319         | 629                | 370         | 1751               | 360         | 504                | 368         | 1114               | 355         | 582                |



TABLE IX.—MALES.

*Shewing the Actual Amount of Crime for the average of the years 1842, 1843, and 1844, contrasted with the ratio for the whole of England and Wales during the same years in each Group of the Great Northern and Midland Mining and Manufacturing District.*

| COUNTY AND DISTRICT.                                                                                   | Under 15.   |         | 15—20.      |         | 20—25.      |         | 25—30.      |         | 30—40.      |         | 40—50.      |             | 50—60.  |             | 60 & upwards. |             | Total.      |         |
|--------------------------------------------------------------------------------------------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|-------------|---------|-------------|---------------|-------------|-------------|---------|
|                                                                                                        | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Calculated. | Actual. | Calculated. | Actual.       | Calculated. | Calculated. | Actual. |
| Northern Mining District {<br>Cumberland<br>Northumb.<br>Durham.                                       | 16          | 4       | 61          | 12      | 60          | 14      | 37          | 14      | 39          | 16      | 20          | 11          | 10      | 6           | 5             | 4           | 248         | 81      |
|                                                                                                        | 22          | 22      | 84          | 49      | 90          | 49      | 58          | 26      | 59          | 30      | 28          | 13          | 13      | 6           | 7             | 2           | 361         | 197     |
|                                                                                                        | 30          | 12      | 112         | 50      | 122         | 63      | 79          | 47      | 77          | 42      | 35          | 23          | 15      | 7           | 8             | 4           | 478         | 248     |
| Cotton and Woollen Manufacture {<br>Lancashire.<br>Yorkshire .                                         | 68          | 38      | 257         | 111     | 272         | 126     | 174         | 87      | 175         | 88      | 83          | 47          | 38      | 19          | 20            | 10          | 1087        | 526     |
|                                                                                                        | 150         | 185     | 582         | 637     | 624         | 672     | 416         | 448     | 432         | 502     | 189         | 242         | 76      | 82          | 32            | 34          | 2501        | 2802    |
|                                                                                                        | 147         | 86      | 565         | 371     | 570         | 485     | 371         | 337     | 371         | 317     | 181         | 134         | 83      | 60          | 41            | 28          | 2329        | 1818    |
| Cotton, Wool-<br>len, Silk, and<br>Lace Fabrics {<br>Chester .<br>Derby .<br>Nottingham<br>Leicester . | 297         | 271     | 1147        | 1008    | 1194        | 1157    | 787         | 785     | 803         | 819     | 370         | 376         | 159     | 142         | 73            | 62          | 4830        | 4620    |
|                                                                                                        | 36          | 61      | 139         | 160     | 142         | 181     | 92          | 122     | 94          | 139     | 44          | 72          | 19      | 37          | 9             | 20          | 575         | 792     |
|                                                                                                        | 25          | 8       | 94          | 40      | 93          | 70      | 63          | 50      | 65          | 57      | 32          | 26          | 15      | 18          | 8             | 7           | 395         | 276     |
| Hardware, Pot-<br>tery, and Glass {<br>Stafford .<br>Warwick .<br>Manufacture {<br>Worcester .         | 23          | 19      | 81          | 69      | 79          | 88      | 53          | 41      | 59          | 50      | 30          | 27          | 14      | 10          | 7             | 3           | 346         | 307     |
|                                                                                                        | 19          | 25      | 74          | 105     | 70          | 107     | 46          | 66      | 49          | 75      | 26          | 30          | 12      | 11          | 7             | 12          | 303         | 431     |
|                                                                                                        | 103         | 113     | 388         | 374     | 384         | 446     | 254         | 279     | 267         | 321     | 132         | 155         | 60      | 76          | 31            | 42          | 1619        | 1806    |
| Total, forming the Great<br>Northern and Midland<br>Mining and Manufactur-<br>ing District . . . .     | 49          | 49      | 179         | 176     | 190         | 256     | 129         | 168     | 126         | 180     | 58          | 77          | 25      | 38          | 12            | 18          | 768         | 962     |
|                                                                                                        | 35          | 63      | 131         | 226     | 142         | 200     | 96          | 111     | 98          | 131     | 48          | 61          | 20      | 21          | 10            | 12          | 580         | 825     |
|                                                                                                        | 21          | 28      | 75          | 116     | 78          | 134     | 52          | 84      | 55          | 86      | 28          | 42          | 12      | 20          | 7             | 6           | 328         | 516     |
| Total, forming the Great<br>Northern and Midland<br>Mining and Manufactur-<br>ing District . . . .     | 105         | 140     | 385         | 518     | 410         | 590     | 277         | 363     | 279         | 397     | 134         | 180         | 57      | 79          | 29            | 36          | 1676        | 2303    |
|                                                                                                        | 573         | 562     | 2177        | 2011    | 2260        | 2319    | 1492        | 1514    | 1524        | 1625    | 719         | 758         | 314     | 316         | 153           | 150         | 9212        | 9255    |



TABLE IX.—MALES.—(continued.)

For the Agricultural Counties.

| COUNTY AND DISTRICT.                            | Under 15.   |         | 15—20.      |         | 20—25.      |         | 25—30.      |         | 30—40.      |         | 40—50.      |         | 50—60.      |         | 60 & upwards. |         | Total.      |        |
|-------------------------------------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|---------------|---------|-------------|--------|
|                                                 | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated.   | Actual. | Calculated. | Total. |
| North-Eastern<br>and Eastern                    | 33          | 11      | 125         | 75      | 129         | 129     | 82          | 81      | 83          | 81      | 44          | 37      | 20          | 14      | 11            | 5       | 527         | 433    |
|                                                 | 37          | 54      | 138         | 176     | 128         | 164     | 81          | 89      | 89          | 92      | 50          | 45      | 22          | 25      | 14            | 16      | 559         | 661    |
|                                                 | 29          | 26      | 106         | 116     | 100         | 141     | 63          | 71      | 68          | 75      | 36          | 34      | 17          | 17      | 11            | 12      | 430         | 492    |
|                                                 | 32          | 30      | 114         | 145     | 118         | 151     | 76          | 85      | 79          | 99      | 43          | 48      | 19          | 20      | 10            | 11      | 491         | 589    |
| Midland . . .                                   | 131         | 121     | 483         | 512     | 475         | 585     | 302         | 326     | 319         | 347     | 173         | 164     | 78          | 76      | 46            | 44      | 2007        | 2175   |
|                                                 | 15          | 11      | 56          | 47      | 61          | 66      | 37          | 37      | 37          | 36      | 20          | 20      | 8           | 10      | 4             | 1       | 238         | 228    |
|                                                 | 18          | 11      | 70          | 46      | 69          | 75      | 43          | 45      | 46          | 43      | 24          | 24      | 11          | 11      | 6             | 6       | 287         | 261    |
|                                                 | 15          | 10      | 54          | 51      | 53          | 72      | 34          | 39      | 36          | 50      | 18          | 23      | 8           | 8       | 5             | 5       | 223         | 258    |
|                                                 | 10          | 9       | 36          | 38      | 35          | 47      | 22          | 29      | 24          | 31      | 12          | 19      | 5           | 7       | 3             | 4       | 147         | 184    |
|                                                 | 14          | 10      | 53          | 60      | 50          | 69      | 33          | 42      | 34          | 48      | 18          | 20      | 9           | 9       | 5             | 5       | 216         | 263    |
|                                                 | 15          | 15      | 55          | 48      | 57          | 70      | 34          | 45      | 36          | 49      | 19          | 22      | 9           | 9       | 5             | 7       | 230         | 265    |
| Southern and<br>South-<br>Western               | 15          | 12      | 54          | 58      | 55          | 65      | 35          | 34      | 38          | 46      | 19          | 19      | 9           | 12      | 5             | 5       | 230         | 251    |
|                                                 | 102         | 78      | 378         | 348     | 380         | 464     | 238         | 271     | 251         | 303     | 130         | 147     | 59          | 66      | 33            | 33      | 1571        | 1710   |
|                                                 | 28          | 24      | 96          | 92      | 96          | 97      | 62          | 54      | 68          | 72      | 35          | 37      | 16          | 18      | 9             | 11      | 410         | 405    |
|                                                 | 32          | 26      | 119         | 104     | 125         | 140     | 79          | 83      | 79          | 78      | 41          | 42      | 21          | 25      | 11            | 12      | 507         | 510    |
| Total of the Agricultural<br>Counties . . . . . | 24          | 20      | 91          | 100     | 88          | 108     | 53          | 56      | 56          | 73      | 31          | 40      | 14          | 19      | 9             | 8       | 366         | 424    |
|                                                 | 16          | 7       | 56          | 39      | 51          | 45      | 34          | 26      | 37          | 36      | 19          | 14      | 9           | 7       | 6             | 9       | 228         | 183    |
|                                                 | 39          | 50      | 148         | 220     | 178         | 224     | 90          | 128     | 95          | 116     | 51          | 55      | 24          | 30      | 14            | 20      | 639         | 843    |
| Total of the Agricultural<br>Counties . . . . . | 139         | 127     | 510         | 555     | 538         | 614     | 318         | 347     | 335         | 375     | 177         | 188     | 84          | 99      | 49            | 60      | 2150        | 2365   |
|                                                 | 372         | 326     | 1371        | 1415    | 1393        | 1663    | 858         | 944     | 905         | 1025    | 480         | 499     | 221         | 241     | 128           | 137     | 5728        | 6250   |



TABLE X.

*Shewing the actual amount of Crime in each County, according to the average of the years 1845, 1846, 1847, and 1848; and also the calculated amount supposing the ratio to be the same as that for the whole of England and Wales during the same years.—Males.*

| Age.             | BEDFORD.    |         | BERKS.      |         | BUCKS.      |         | CAMBRIDGE.  |         | CHESHIRE.   |         | CORNWALL.   |         | CUMBERLAND. |         |
|------------------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|
|                  | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. |
| Under 15 . . .   | 3           | 6       | 4           | 12      | 4           | 10      | 4           | 6       | 11          | 39      | 10          | 14      | 4           | 5       |
| 15...20 . . .    | 36          | 36      | 54          | 59      | 52          | 69      | 57          | 49      | 146         | 143     | 122         | 43      | 60          | 16      |
| 20...30 . . .    | 54          | 62      | 87          | 104     | 77          | 120     | 95          | 89      | 238         | 258     | 163         | 86      | 90          | 36      |
| 30...40 . . .    | 23          | 29      | 36          | 45      | 31          | 40      | 36          | 42      | 93          | 124     | 66          | 38      | 35          | 16      |
| 40...50 . . .    | 12          | 19      | 18          | 23      | 17          | 20      | 19          | 17      | 44          | 59      | 36          | 24      | 19          | 10      |
| 50...60 . . .    | 4           | 5       | 7           | 10      | 7           | 6       | 7           | 9       | 17          | 24      | 14          | 10      | 9           | 4       |
| 60 and upwards   | 2           | 2       | 5           | 3       | 4           | 4       | 4           | 5       | 9           | 10      | 8           | 7       | 5           | 3       |
| Total . . .      | 134         | 159     | 211         | 256     | 192         | 289     | 222         | 217     | 558         | 657     | 419         | 222     | 222         | 90      |
| Population . . . | 40646       | ...     | 63952       | ...     | 59158       | ...     | 65175       | ...     | 161416      | ...     | 127615      | ...     | 67202       | ...     |
| Proportion;—1 in | 303         | 256     | 303         | 250     | 308         | 205     | 293         | 300     | 289         | 246     | 304         | 575     | 303         | 747     |
|                  |             |         |             |         |             |         |             |         |             |         |             |         |             |         |
|                  | DERBY.      |         | DEVON.      |         | DORSET.     |         | DURHAM.     |         | ESSEX.      |         | GLOUCESTER. |         | HEREFORD.   |         |
|                  | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. |
| Under 15 . . .   | 7           | 9       | 13          | 28      | 5           | 12      | 9           | 11      | 9           | 24      | 11          | 72      | 3           | 7       |
| 15...20 . . .    | 94          | 42      | 176         | 127     | 56          | 41      | 122         | 37      | 113         | 136     | 138         | 227     | 36          | 31      |
| 20...30 . . .    | 151         | 77      | 254         | 139     | 80          | 82      | 218         | 89      | 184         | 219     | 226         | 269     | 57          | 74      |
| 30...40 . . .    | 62          | 39      | 102         | 115     | 34          | 40      | 76          | 39      | 72          | 78      | 94          | 109     | 25          | 30      |
| 40...50 . . .    | 31          | 19      | 57          | 66      | 18          | 20      | 35          | 17      | 41          | 44      | 49          | 60      | 14          | 15      |
| 50...60 . . .    | 12          | 9       | 26          | 30      | 8           | 9       | 13          | 7       | 16          | 19      | 19          | 29      | 6           | 9       |
| 60 and upwards   | 7           | 4       | 15          | 15      | 5           | 6       | 6           | 3       | 9           | 9       | 11          | 17      | 4           | 5       |
| Total . . .      | 364         | 199     | 643         | 520     | 206         | 210     | 479         | 203     | 444         | 529     | 548         | 783     | 145         | 171     |
| Population . . . | 109180      | ...     | 199188      | ...     | 64493       | ...     | 135334      | ...     | 135252      | ...     | 166127      | ...     | 45280       | ...     |
| Proportion;—1 in | 300         | 549     | 310         | 383     | 313         | 307     | 282         | 667     | 305         | 256     | 303         | 212     | 312         | 265     |



TABLE X.—MALES.—(continued.)

| Age.               | HERTFORD.   |         | HUNTS.      |         | KENT.        |         | LANCASTER.      |         | LEICESTER.  |         | LINCOLN.    |         | MIDDLESEX.  |         |
|--------------------|-------------|---------|-------------|---------|--------------|---------|-----------------|---------|-------------|---------|-------------|---------|-------------|---------|
|                    | Calculated. | Actual. | Calculated. | Actual. | Calculated.  | Actual. | Calculated.     | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. |
| Under 15 . . .     | 4           | 10      | 1           | 4       | 14           | 36      | 44              | 139     | 6           | 17      | 9           | 14      | 34          | 296     |
| 15...20 . . .      | 53          | 60      | 20          | 16      | 190          | 162     | 626             | 581     | 73          | 87      | 125         | 71      | 476         | 1100    |
| 20...30 . . .      | 82          | 96      | 32          | 32      | 315          | 296     | 1106            | 943     | 109         | 109     | 204         | 158     | 1002        | 1285    |
| 30...40 . . .      | 33          | 41      | 12          | 13      | 121          | 120     | 444             | 451     | 45          | 44      | 79          | 71      | 407         | 477     |
| 40...50 . . .      | 17          | 24      | 7           | 6       | 58           | 62      | 193             | 199     | 25          | 21      | 42          | 33      | 200         | 257     |
| 50...60 . . .      | 7           | 9       | 2           | 2       | 26           | 19      | 68              | 77      | 10          | 10      | 16          | 11      | 69          | 99      |
| 60 & upwards.      | 4           | 6       | 1           | 1       | 17           | 15      | 30              | 33      | 6           | 7       | 10          | 7       | 30          | 44      |
| Total . . .        | 200         | 246     | 75          | 74      | 741          | 710     | 2511            | 2423    | 274         | 295     | 485         | 365     | 2218        | 3558    |
| Population . . .   | 60970       | ...     | 22585       | ...     | 223242       | ...     | 702911          | ...     | 83256       | ...     | 145103      | ...     | 629729      | ...     |
| Proportion;—1 in   | 305         | 248     | 301         | 305     | 301          | 314     | 280             | 290     | 304         | 282     | 300         | 397     | 284         | 177     |
|                    | MONMOUTH.   |         | NORFOLK.    |         | NORTHAMPTON. |         | NORTHUMBERLAND. |         | NOTTINGHAM. |         | OXFORD.     |         | RUTLAND.    |         |
|                    | Calculated. | Actual. | Calculated. | Actual. | Calculated.  | Actual. | Calculated.     | Actual. | Calculated. | Actual. | Calculated. | Actual. | Calculated. | Actual. |
| Under 15 . . .     | 4           | 7       | 11          | 33      | 5            | 11      | 6               | 10      | 7           | 16      | 4           | 9       | 1           | 1       |
| 15...20 . . .      | 51          | 33      | 136         | 147     | 70           | 46      | 84              | 38      | 80          | 74      | 53          | 51      | 7           | 3       |
| 20...30 . . .      | 112         | 85      | 192         | 224     | 108          | 105     | 146             | 54      | 126         | 108     | 85          | 95      | 10          | 15      |
| 30...40 . . .      | 40          | 35      | 82          | 83      | 43           | 42      | 56              | 22      | 57          | 40      | 33          | 43      | 5           | 8       |
| 40...50 . . .      | 18          | 22      | 48          | 60      | 23           | 18      | 27              | 9       | 29          | 19      | 18          | 24      | 2           | 2       |
| 50...60 . . .      | 6           | 6       | 18          | 23      | 9            | 8       | 11              | 4       | 12          | 7       | 7           | 12      | 1           | 1       |
| 60 & upwards . . . | 3           | 5       | 12          | 13      | 5            | 6       | 6               | 2       | 7           | 3       | 5           | 6       | 1           | 1       |
| Total . . .        | 234         | 193     | 499         | 583     | 263          | 236     | 336             | 139     | 318         | 267     | 205         | 240     | 27          | 31      |
| Population . . .   | 64892       | ...     | 156326      | ...     | 78962        | ...     | 97483           | ...     | 98442       | ...     | 62794       | ...     | 8384        | ...     |
| Proportion;—1 in   | 277         | 336     | 313         | 268     | 300          | 335     | 290             | 701     | 309         | 369     | 306         | 261     | 311         | 270     |



TABLE X.—MALES.—(*continued.*)

| AGE.             | SALOP.      |                    | SOMERSET.   |                    | SOUTHAMPTON.  |                    | STAFFORD.   |                    | SUFFOLK.    |                    | SURREY.     |                    |
|------------------|-------------|--------------------|-------------|--------------------|---------------|--------------------|-------------|--------------------|-------------|--------------------|-------------|--------------------|
|                  | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated.   | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. |
| Under 15 . . .   | 6           | 12                 | 11          | 43                 | 9             | 39                 | 14          | 41                 | 8           | 19                 | 15          | 64                 |
| 15...20 . . .    | 83          | 41                 | 149         | 171                | 121           | 128                | 190         | 164                | 104         | 84                 | 181         | 232                |
| 20...30 . . .    | 128         | 83                 | 218         | 242                | 203           | 221                | 333         | 303                | 151         | 169                | 342         | 334                |
| 30...40 . . .    | 49          | 34                 | 87          | 92                 | 73            | 84                 | 126         | 118                | 62          | 59                 | 145         | 130                |
| 40...50 . . .    | 27          | 25                 | 49          | 51                 | 39            | 43                 | 58          | 56                 | 34          | 37                 | 71          | 65                 |
| 50...60 . . .    | 11          | 11                 | 20          | 28                 | 18            | 22                 | 22          | 23                 | 14          | 16                 | 26          | 29                 |
| 60 & upwards .   | 7           | 8                  | 12          | 12                 | 10            | 13                 | 11          | 14                 | 9           | 9                  | 13          | 10                 |
| Total . . .      | 311         | 214                | 546         | 639                | 473           | 550                | 754         | 719                | 382         | 393                | 793         | 864                |
| Population . . . | 93540       | ...                | 166952      | ...                | 142197        | ...                | 215051      | ...                | 119516      | ...                | 234579      | ...                |
| Proportion;—1 in | 301         | 437                | 306         | 261                | 300           | 258                | 283         | 299                | 313         | 304                | 296         | 271                |
|                  | SUSSEX.     |                    | WARWICK.    |                    | WESTMORELAND. |                    | WILTS.      |                    | WORCESTER.  |                    | YORK.       |                    |
|                  | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated.   | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. | Calculated. | Number.<br>Actual. |
| Under 15 . . .   | 8           | 32                 | 10          | 51                 | 2             | 1                  | 7           | 17                 | 6           | 27                 | 42          | 66                 |
| 15...20 . . .    | 96          | 87                 | 136         | 229                | 2             | 7                  | 91          | 92                 | 75          | 115                | 585         | 306                |
| 20...30 . . .    | 152         | 152                | 243         | 304                | 29            | 19                 | 132         | 146                | 124         | 200                | 947         | 560                |
| 30...40 . . .    | 65          | 64                 | 97          | 117                | 11            | 8                  | 52          | 59                 | 52          | 70                 | 359         | 261                |
| 40...50 . . .    | 34          | 36                 | 48          | 50                 | 6             | 5                  | 29          | 38                 | 27          | 34                 | 178         | 108                |
| 50...60 . . .    | 14          | 13                 | 17          | 19                 | 3             | 2                  | 11          | 17                 | 10          | 15                 | 104         | 41                 |
| 60 & upwards .   | 8           | 11                 | 9           | 8                  | 2             | 1                  | 8           | 9                  | 6           | 10                 | 37          | 21                 |
| Total . . .      | 377         | 395                | 560         | 778                | 55            | 43                 | 330         | 378                | 300         | 471                | 2252        | 1363               |
| Population . . . | 116932      | ...                | 163185      | ...                | 22215         | ...                | 100851      | ...                | 91301       | ...                | 644534      | ...                |
| Proportion;—1 in | 310         | 296                | 291         | 210                | 404           | 516                | 305         | 267                | 304         | 194                | 286         | 473                |



TABLE XI.

*England and Wales.—Males.*Annual rate of increase for 1842-4 =  $1.029533 = \lambda^1 0.0126075$ .

| Counties.         | 1842-4.                                                        |             |                                 |         |               |                      | 1845-8.                                                        |               |                      |
|-------------------|----------------------------------------------------------------|-------------|---------------------------------|---------|---------------|----------------------|----------------------------------------------------------------|---------------|----------------------|
|                   | Amount of Crime according to the average of England and Wales. |             |                                 |         | Actual Crime. | Difference per cent. | Amount of Crime according to the average of England and Wales. | Actual Crime. | Difference per cent. |
|                   | Total Crime.                                                   | $\lambda$ . | Corrected $\lambda$ and number. |         |               |                      |                                                                |               |                      |
| Bedford .....     | 147                                                            | 2.1673173   | 2.1799248                       | 151.30  | 184           | + 21.8               | 134                                                            | 159           | + 18.6               |
| Berks .....       | 230                                                            | 2.3617278   | 2.3743353                       | 236.77  | 257           | + 8.5                | 211                                                            | 256           | + 21.3               |
| Bucks .....       | 216                                                            | 2.3344538   | 2.3470613                       | 222.36  | 263           | + 18.5               | 192                                                            | 289           | + 50.5               |
| Cambridge .....   | 238                                                            | 2.3765770   | 2.3891845                       | 245.01  | 228           | - 6.9                | 222                                                            | 217           | - 2.2                |
| Cheshire .....    | 575                                                            | 2.7596678   | 2.7712753                       | 590.57  | 792           | + 34.2               | 558                                                            | 657           | + 17.7               |
| Cornwall .....    | 460                                                            | 2.6627578   | 2.6753653                       | 473.55  | 215           | - 54.5               | 419                                                            | 222           | - 47.0               |
| Cumberland .....  | 248                                                            | 2.3944517   | 2.4070592                       | 255.30  | 81            | - 68.2               | 222                                                            | 90            | - 14.4               |
| Derby .....       | 395                                                            | 2.5965971   | 2.6092046                       | 406.63  | 270           | - 33.6               | 364                                                            | 199           | - 45.3               |
| Devon .....       | 712                                                            | 2.8524800   | 2.8650875                       | 732.97  | 547           | - 25.4               | 643                                                            | 520           | - 19.1               |
| Dorset .....      | 228                                                            | 2.3579348   | 2.3705423                       | 234.72  | 183           | - 22.1               | 206                                                            | 210           | + 1.9                |
| Durham .....      | 478                                                            | 2.6794279   | 2.6920354                       | 492.08  | 248           | - 49.6               | 479                                                            | 203           | - 57.6               |
| Essex .....       | 491                                                            | 2.6910815   | 2.7036890                       | 505.46  | 589           | + 16.6               | 444                                                            | 529           | + 19.1               |
| Gloucester .....  | 593                                                            | 2.7730547   | 2.7856622                       | 610.47  | 932           | + 52.8               | 548                                                            | 783           | + 42.9               |
| Hereford .....    | 163                                                            | 2.2121876   | 2.2247951                       | 167.80  | 197           | + 17.3               | 145                                                            | 171           | + 17.9               |
| Herts .....       | 223                                                            | 2.3483049   | 2.3609124                       | 229.57  | 258           | + 12.2               | 200                                                            | 246           | + 23.0               |
| Hunts .....       | 85                                                             | 1.9294189   | 1.9420264                       | 87.50   | 58            | - 33.3               | 75                                                             | 74            | - 1.3                |
| Kent .....        | 787                                                            | 2.8959747   | 2.9085822                       | 810.18  | 835           | + 3.1                | 741                                                            | 710           | - 4.2                |
| Lancaster .....   | 2501                                                           | 3.3981137   | 3.4107212                       | 2574.67 | 2802          | + 8.8                | 2511                                                           | 2423          | - 3.5                |
| Leicester .....   | 303                                                            | 2.4814426   | 2.4940501                       | 311.92  | 431           | + 38.1               | 274                                                            | 295           | + 7.6                |
| Lincoln .....     | 527                                                            | 2.7218106   | 2.7344181                       | 542.52  | 433           | - 20.1               | 485                                                            | 365           | - 24.7               |
| Middlesex .....   | 2326                                                           | 3.3666097   | 3.3792172                       | 2394.51 | 3056          | + 27.7               | 2218                                                           | 3558          | + 60.4               |
| Monmouth .....    | 225                                                            | 2.3521825   | 2.3647900                       | 231.62  | 201           | - 13.3               | 234                                                            | 193           | - 17.5               |
| Norfolk .....     | 559                                                            | 2.7474118   | 2.7600193                       | 575.46  | 661           | + 14.9               | 499                                                            | 583           | + 16.8               |
| Northampton ..... | 287                                                            | 2.4578819   | 2.4704894                       | 295.45  | 261           | - 11.5               | 263                                                            | 236           | - 10.3               |
| Northumberland .. | 361                                                            | 2.5575072   | 2.5701147                       | 371.63  | 197           | - 47.0               | 336                                                            | 139           | - 58.6               |
| Notts .....       | 346                                                            | 2.5390761   | 2.5516836                       | 356.19  | 307           | - 13.8               | 318                                                            | 267           | - 16.0               |
| Oxford .....      | 230                                                            | 2.3617278   | 2.3743353                       | 236.77  | 265           | + 11.8               | 205                                                            | 240           | + 17.1               |
| Rutland .....     | 30                                                             | 1.4771213   | 1.4897288                       | 30.88   | 31            | + .4                 | 27                                                             | 31            | + 14.8               |
| Salop .....       | 348                                                            | 2.5415792   | 2.5541867                       | 358.25  | 399           | + 11.4               | 311                                                            | 214           | - 31.2               |
| Somerset .....    | 639                                                            | 2.8055009   | 2.8181084                       | 659.34  | 843           | + 27.9               | 546                                                            | 639           | + 17.0               |
| Southampton ..... | 507                                                            | 2.7050080   | 2.7176155                       | 521.93  | 510           | - 2.3                | 473                                                            | 550           | + 16.3               |
| Stafford .....    | 768                                                            | 2.8853612   | 2.8979687                       | 790.62  | 962           | + 21.6               | 754                                                            | 719           | - 4.7                |
| Suffolk .....     | 430                                                            | 2.6331685   | 2.6460760                       | 442.67  | 492           | + 11.1               | 382                                                            | 393           | + 2.9                |
| Surrey .....      | 820                                                            | 2.9138139   | 2.9264214                       | 844.16  | 728           | - 13.7               | 793                                                            | 864           | + 8.9                |
| Sussex .....      | 410                                                            | 2.6127839   | 2.6253914                       | 422.08  | 405           | - 4.0                | 377                                                            | 395           | + 4.8                |
| Warwick .....     | 580                                                            | 2.7634280   | 2.7760355                       | 597.08  | 825           | + 38.2               | 560                                                            | 778           | + 38.9               |
| Westmoreland .... | 82                                                             | 1.9138139   | 1.9264214                       | 84.41   | 27            | - 67.8               | 55                                                             | 43            | - 21.8               |
| Wilts .....       | 366                                                            | 2.5634811   | 2.5760886                       | 376.78  | 417           | + 10.7               | 330                                                            | 378           | + 14.5               |
| Worcester .....   | 328                                                            | 2.5158738   | 2.5284813                       | 337.66  | 516           | + 52.7               | 300                                                            | 471           | + 57.0               |
| York .....        | 2329                                                           | 3.3671695   | 3.3797770                       | 2397.60 | 1818          | - 24.2               | 2252                                                           | 1363          | - 39.5               |



The first column of each group shews the amount of crime at each period of life, assuming the intensity to be the same as over the whole country, and also that the population of each group was the same as at the period of the census in 1841. Under the total of these results will be found the corrected total, making allowance for the increase of population during the years 1842, 1843, and 1844. These corrections were taken from Table XI, and in the early part of this paper the formula for the correction is given. In the next column of each group will be found the actual number of criminals at the same ages, and in the third column is set forth the difference per cent. between the calculated and actual amount of crime. The results of this column are of the utmost importance, as they shew not only whether the total amount of crime in a given district is above or below the average for the whole kingdom, but they also point out what are the periods of life at which the most marked and important differences exist, thus leading the way to more definite and accurate views on criminal jurisprudence.

If the whole group of the Great Northern and Midland mining and manufacturing districts be taken, it will be seen that there is exactly 2·3 per cent. less crime than would be according to the average for all England and Wales, while in the agricultural counties there is an excess of 5·9 per cent. Again, if the various groups of the manufacturing and mining districts be examined, it will be found that in the northern mining district, which includes Cumberland, Northumberland, and Durham, crime is 52·1 per cent. below the average; and in the cotton and woollen manufacturing district, which includes Lancashire and Yorkshire, crime is 7·0 per cent. under the average of the whole country; but, on the other hand, in the two remaining districts, the one composing the cotton, woollen, silk, and lace-fabric district, including Chester, Derby, Nottingham, and Leicester—and the other composing the hardware, pottery, and glass manufacturing district, including Staffordshire, Warwick, and Worcester—there is an increase of crime, the former being 8·5 per cent. and the latter 33·5 per cent. above the average for the whole kingdom. Contrasting the various sections of the agricultural group with them, they will be seen to present a remarkable uniformity; the excess of crime in the first division being 5·3 per cent., in the second 5·7 per cent., and in the third 6·8 per cent., while the excess for the whole of the agricultural districts combined has been shewn to be 5·9 per cent.

It is, therefore, evident that there is something in the mining and manufacturing condition of the people, having a powerful influence in stimulating the amount of crime, as in one portion there is an excess of 33·5 per cent., while in another, crime is 52·1 per cent. below the average; and although the whole combined shews a less degree of crime than the average of the whole agricultural districts, and also less than the average of all England and Wales, still the remarkable disparity existing between particular manufacturing groups bears evidence that there must be some peculiar element operating in the social and moral state of the people, which it is highly important to understand.

[Before,



TABLE XII.—MALES.

*Difference between the Actual Amount of Crime in each District and the Average for England and Wales.*

| Age.              | GREAT NORTHERN AND MIDLAND MINING AND MANUFACTURING DISTRICTS. |         |                      |                                 |         |                      |                                            |         |                      |                                           |         |                      |
|-------------------|----------------------------------------------------------------|---------|----------------------|---------------------------------|---------|----------------------|--------------------------------------------|---------|----------------------|-------------------------------------------|---------|----------------------|
|                   | Northern Mining District.                                      |         |                      | Cotton and Woollen Manufacture. |         |                      | Cotton, Woollen, Silk, and Lace Fabrics.   |         |                      | Hardware, Pottery, and Glass Manufacture. |         |                      |
|                   | Cumberland, Northumberland, and Durham.                        |         |                      | Lancashire and Yorkshire.       |         |                      | Chester, Derby, Nottingham, and Leicester. |         |                      | Staffordshire, Warwick, and Worcester.    |         |                      |
|                   | Calculated.                                                    | Actual. | Difference per Cent. | Calculated.                     | Actual. | Difference per Cent. | Calculated.                                | Actual. | Difference per Cent. | Calculated.                               | Actual. | Difference per Cent. |
| Under 15          | 68                                                             | 38      | - 29.4               | 297                             | 271     | - 8.7                | 103                                        | 113     | + 9.7                | 105                                       | 140     | + 33.3               |
| 15 ... 20         | 257                                                            | 111     | - 56.8               | 1147                            | 1008    | - 12.1               | 388                                        | 374     | - 3.6                | 385                                       | 518     | + 34.5               |
| 20 ... 25         | 272                                                            | 126     | - 53.6               | 1194                            | 1157    | - 3.1                | 384                                        | 446     | - 1.6                | 410                                       | 590     | + 43.0               |
| 25 ... 30         | 174                                                            | 87      | - 50.0               | 787                             | 785     | - .2                 | 254                                        | 279     | + 9.8                | 277                                       | 363     | + 31.0               |
| 30 ... 40         | 175                                                            | 88      | - 49.7               | 803                             | 819     | + 1.9                | 267                                        | 321     | - 20.2               | 279                                       | 397     | + 42.3               |
| 40 ... 50         | 83                                                             | 47      | - 43.3               | 370                             | 376     | + 1.6                | 132                                        | 155     | + 17.4               | 134                                       | 180     | + 34.3               |
| 50 ... 60         | 38                                                             | 19      | - 50.0               | 159                             | 142     | - 10.6               | 60                                         | 76      | + 26.6               | 57                                        | 79      | + 38.5               |
| 60 & upwards      | 20                                                             | 10      | - 50.0               | 73                              | 62      | - 15.0               | 31                                         | 42      | + 35.5               | 29                                        | 36      | + 24.1               |
| Total . . .       | 1087                                                           | 526     | - 51.6               | 4830                            | 4620    | - 4.3                | 1619                                       | 1806    | + 11.5               | 1676                                      | 2303    | + 37.4               |
| Corrected Total   | 1119                                                           | ...     | - 52.1               | 4972                            | ...     | - 7.0                | 1665                                       | ...     | + 8.5                | 1725                                      | ...     | + 33.5               |
| Population .      | 366492                                                         |         |                      | 1598486                         |         |                      | 554607                                     |         |                      | 566617                                    |         |                      |
| Proportion; -1 in | 327-337                                                        |         |                      | 321-346                         |         |                      | 333-342                                    |         |                      | 328-338                                   |         |                      |
|                   |                                                                |         |                      |                                 |         |                      |                                            |         |                      | 3086202                                   |         |                      |
|                   |                                                                |         |                      |                                 |         |                      |                                            |         |                      | 325-333                                   |         |                      |



TABLE XII.—MALES.—(continued.)

| Age.              | AGRICULTURAL COUNTIES.                |         |                      |                                                                |         |                      |                                             |         |                      |             |         |                      |
|-------------------|---------------------------------------|---------|----------------------|----------------------------------------------------------------|---------|----------------------|---------------------------------------------|---------|----------------------|-------------|---------|----------------------|
|                   | North Eastern and Eastern.            |         |                      | Midland.                                                       |         |                      | Southern and South Western.                 |         |                      | Total.      |         |                      |
|                   | Lincoln, Norfolk, Suffolk, and Essex. |         |                      | Cambridge, Northampton, Herts, Beds, Bucks, Oxford, and Berks. |         |                      | Sussex, Hants, Wilts, Dorset, and Somerset. |         |                      |             |         |                      |
|                   | Calculated.                           | Actual. | Difference per Cent. | Calculated.                                                    | Actual. | Difference per Cent. | Calculated.                                 | Actual. | Difference per Cent. | Calculated. | Actual. | Difference per Cent. |
| Under 15          | 131                                   | 121     | — 7.6                | 102                                                            | 78      | — 23.5               | 139                                         | 127     | — 8.6                | 372         | 326     | — 12.3               |
| 15 to 20          | 483                                   | 512     | + 6.0                | 378                                                            | 348     | — 7.9                | 510                                         | 555     | + 8.8                | 1371        | 1415    | + 3.2                |
| 20 ... 25         | 475                                   | 585     | + 23.1               | 380                                                            | 464     | + 22.1               | 538                                         | 614     | + 14.1               | 1393        | 1663    | + 19.3               |
| 25 ... 30         | 302                                   | 326     | + 7.9                | 238                                                            | 271     | + 13.8               | 318                                         | 347     | + 9.1                | 858         | 944     | + 10.0               |
| 30 ... 40         | 319                                   | 347     | + 8.7                | 251                                                            | 303     | + 20.7               | 335                                         | 375     | + 11.9               | 905         | 1025    | + 13.3               |
| 40 ... 50         | 173                                   | 164     | — 5.2                | 130                                                            | 147     | + 13.0               | 177                                         | 188     | + 6.2                | 480         | 499     | + 3.5                |
| 50 ... 60         | 78                                    | 76      | — 2.5                | 59                                                             | 66      | + 11.8               | 84                                          | 99      | + 17.8               | 221         | 241     | + 9.1                |
| 60 and upwards    | 46                                    | 44      | — 4.3                | 33                                                             | 33      | ...                  | 49                                          | 60      | + 24.5               | 128         | 137     | + 7.0                |
| Total . . . .     | 2007                                  | 2175    | + 8.3                | 1571                                                           | 1710    | + 8.8                | 2150                                        | 2365    | + 10.0               | 5728        | 6250    | + 9.1                |
| Corrected Total . | 2066                                  | ...     | + 5.3                | 1617                                                           | ...     | + 5.7                | 2215                                        | ...     | + 6.8                | 5898        | ...     | + 5.9                |
| Population . .    |                                       | 704380  |                      |                                                                | 545243  |                      |                                             | 740727  |                      |             | 1990350 |                      |
| Proportion ;—1 in |                                       | 340-324 |                      |                                                                | 337-318 |                      |                                             | 334-313 |                      |             | 337-318 |                      |



Before, however, entering further into that part of the subject, it may be better to refer to another feature of importance in Table XII, for the first time exhibiting anything like a clear view of the question.

It has been usual of late to refer to juvenile delinquency as an explanation of the increase of crime in many districts; in fact, so powerfully has this been felt in some quarters, that the most strenuous efforts have been made, with a view of reducing the cases on the criminal calendar; and yet it will be seen that the facts of the case do not support the supposition, that either the increase or decrease of crime in particular districts is materially, if at all, affected by fluctuations in juvenile crime. This will appear most evident by an inspection of any one of the nine groups, or combinations, given in Table XII. If the general result for any one, or all of them, whether in connection with an increase or decrease of crime, be compared with the corresponding features at the juvenile ages, there will not be found a single instance, in which the character of the general result is so strongly confirmed by the facts at the younger ages, as by those at the more advanced periods of life. Should any change or movement be found in the criminal returns of any particular district, that change will be discovered to be promoted, not so much by fluctuations at the terms of life 10-15 or 15-20, as by the increase or decrease among those persons of more advanced ages. The general total for the mining and manufacturing districts shews a difference of + .4 per cent., but at the juvenile ages under 15 and 15-20, the differences are -1.9 per cent. and -7.6 per cent. respectively, so that while the gross results are positive, those at the younger ages are negative. Again, the general total for the agricultural districts is + 9.1 per cent., but the result for under 15 is - 12.3 per cent., and for 15-20 only + 3.2 per cent. Relations precisely similar will be found in each of the other groups, thus leading to the conclusion that, in the juvenile period of life, the tendency to crime is within the influence of more constant laws or elements, and therefore shews less fluctuation than in mature life, when the conduct and disposition of individuals come more under the control of external circumstances.

In such groups of counties and districts as those given in Table XII, it is evidently of the first importance, that the manufacturing or agricultural character of the districts should, in reality, be a decided and prevailing feature, otherwise their supposed relation and influence on crime can never be determined. There are no counties or great districts of the kingdom, in which either agriculture or manufactures prevail to the entire exclusion of other interests; but still there are many districts in which either agriculture or manufactures form so decided a feature, that if the moral and social conditions thence arising have any influence on the amount of crime, the evidence of that supposed influence must be observable. In England and Wales, at the period of the last census, the average ratio of agriculturists to the whole population was 7.9 per cent.; and the first group of the following Table XIV contains the results for the ten counties in which there was found to be the least proportion of agriculturists; and the second group of the same Table contains the results for the eleven counties in which the highest ratio of agricul-



tourists was found. It will be seen that the ratio of agriculturists for each county is set forth in the second column; in the third is given the average annual ratio of crime for the whole kingdom; and in the fourth, the actual crime in the given county. These results are taken from Table XI; and a comparison of the total of the two last columns will shew whether the crime in each group or section is above or below the average for the whole kingdom. If, then, the greater or less proportion of agriculturists in a community has any material influence on the degree of crime, it might reasonably be looked for in the results of those two sections; but it will be found that in the group of least agriculturists there is an excess of 6·0 per cent. of crime above the average of England and Wales, and by excluding the county of Lancaster, which is of sufficient magnitude to form a group of itself, the excess will still be 4·6 per cent. Compare this with the results for the section containing the highest average of agriculturists, and the excess of crime will in that also be found to be exactly 4·6 per cent; and so far, therefore, as a maximum or a minimum ratio of agriculturists in a community is concerned, there seems to be little or no difference in the amount of crime. On reflection, it will appear that a high ratio of agriculturists in any district does not necessarily imply a low ratio of manufacturers, and *vice versa*, as both interests may co-exist in maximum or minimum in any district; another combination was therefore adopted, in order to determine the influence of manufactures.

In England and Wales the average ratio of manufacturers to the whole population is 16·5 per cent.; and in the third group of Table XIV will be found the results for the eight counties in which there is the highest ratio of manufacturers. It thence appears that the actual crime exceeds the average of the whole country by 18·2 per cent., and, exclusive of Lancashire and Middlesex, by 17·7 per cent.; but in the fourth group of the same Table, which is composed of the counties having the least average of manufacturers, the actual crime is under the average by 2·9 per cent.

It is evident that the preceding combinations are liable to the objection, that the influence of the high or low ratio of agriculturists may be neutralised by a corresponding high or low ratio of manufacturers; and hence the preceding curious results. To meet this objection, Groups Fifth and Sixth have been formed.

It has already been stated, that the ratio of agriculturists to manufacturers in England and Wales is 7·9 per cent. to 16·5 per cent.; difference, 8·6 per cent. In order to obtain a group of counties in which the manufacturing interests formed a proper and decidedly prevailing feature, Group 5 has been formed of those counties only in which the manufacturing interest exceeds the agricultural interest by at least 33·33 per cent. more than the above difference for the whole kingdom; and the result arrived at is, that the actual crime exceeds the average of the country by 15·0 per cent.; and excluding the counties of Lancaster and Middlesex, the excess is 10·8 per cent. Again, in the sixth group of Table XIV the results of those counties are given, in which the agriculturists are above the average ratio by at least 50 per cent.; and therefore those two last groups

[must exhibit



TABLE XIII.—MALES.

*Difference between the Actual Amount of Crime in each District and the Average for England and Wales.*

| GREAT NORTHERN AND MIDLAND MINING AND MANUFACTURING DISTRICTS. |                                         |         |                         |                                 |         |                         |                                            |         |                         |                                          |         |                         |                  |         |                         |
|----------------------------------------------------------------|-----------------------------------------|---------|-------------------------|---------------------------------|---------|-------------------------|--------------------------------------------|---------|-------------------------|------------------------------------------|---------|-------------------------|------------------|---------|-------------------------|
| Age.                                                           | Northern Mining District.               |         |                         | Cotton and Woollen Manufacture. |         |                         | Cotton, Woollen, Silk, and Lace Fabrics.   |         |                         | Hardware, Pottery and Glass Manufacture. |         |                         | Total.           |         |                         |
|                                                                | Cumberland, Northumberland, and Durham. |         |                         | Lancashire and Yorkshire.       |         |                         | Chester, Derby, Nottingham, and Leicester. |         |                         | Staffordshire, Warwick, and Worcester.   |         |                         |                  |         |                         |
|                                                                | Calcu-<br>lated.                        | Actual. | Difference<br>per Cent. | Calcu-<br>lated.                | Actual. | Difference<br>per Cent. | Calcu-<br>lated.                           | Actual. | Difference<br>per Cent. | Calcu-<br>lated.                         | Actual. | Difference<br>per Cent. | Calcu-<br>lated. | Actual. | Difference<br>per Cent. |
| Under 15                                                       | 19                                      | 26      | + 36.8                  | 86                              | 205     | + 138.4                 | 31                                         | 81      | + 161.3                 | 30                                       | 119     | + 296.7                 | 166              | 431     | + 159.6                 |
| 15 ... 20                                                      | 266                                     | 91      | - 65.8                  | 1211                            | 887     | - 26.7                  | 393                                        | 346     | - 11.9                  | 401                                      | 508     | + 26.7                  | 2271             | 1832    | - 19.3                  |
| 20 ... 30                                                      | 454                                     | 179     | - 60.6                  | 2053                            | 1503    | - 21.4                  | 624                                        | 552     | - 11.5                  | 700                                      | 807     | + 15.3                  | 3831             | 3041    | - 52.2                  |
| 30 ... 40                                                      | 167                                     | 77      | - 53.9                  | 803                             | 712     | - 11.3                  | 257                                        | 247     | - 3.9                   | 275                                      | 305     | + 10.9                  | 1502             | 1341    | - 10.7                  |
| 40 ... 50                                                      | 81                                      | 36      | - 55.6                  | 371                             | 307     | - 17.2                  | 129                                        | 118     | - 8.5                   | 133                                      | 140     | + 5.3                   | 714              | 601     | - 15.8                  |
| 50 ... 60                                                      | 33                                      | 15      | - 54.5                  | 172                             | 118     | - 31.4                  | 51                                         | 50      | - 2.0                   | 49                                       | 57      | + 16.3                  | 305              | 240     | - 21.3                  |
| 60 & upwards                                                   | 17                                      | 8       | - 52.9                  | 67                              | 54      | - 19.4                  | 29                                         | 24      | - 17.2                  | 26                                       | 32      | + 23.1                  | 139              | 118     | - 15.1                  |
| Total . . .                                                    | 1037                                    | 432     | - 58.5                  | 4763                            | 3786    | - 20.5                  | 1514                                       | 1418    | - 6.3                   | 1614                                     | 1968    | + 21.9                  | 8928             | 7604    | - 14.8                  |
| Population . .                                                 |                                         | 300019  |                         |                                 | 1347445 |                         |                                            | 452294  |                         |                                          | 469537  |                         |                  | 2569295 |                         |
| Proportion;—1 in                                               |                                         | 289-692 |                         |                                 | 283-356 |                         |                                            | 299-319 |                         |                                          | 291-239 |                         |                  | 288-338 |                         |



TABLE XIII.—MALES.—(continued.)

| Age.              | AGRICULTURAL COUNTIES.                |         |                         |                                                                |         |                         |                                             |         |                         |                  |         |                         |
|-------------------|---------------------------------------|---------|-------------------------|----------------------------------------------------------------|---------|-------------------------|---------------------------------------------|---------|-------------------------|------------------|---------|-------------------------|
|                   | North Eastern and Eastern.            |         |                         | Midland.                                                       |         |                         | Southern and South Western.                 |         |                         | Total.           |         |                         |
|                   | Lincoln, Norfolk, Suffolk, and Essex. |         |                         | Cambridge, Northampton, Herts, Beds, Bucks, Oxford, and Berks. |         |                         | Sussex, Hants, Wilts, Dorset, and Somerset. |         |                         |                  |         |                         |
|                   | Calcu-<br>lated.                      | Actual. | Difference<br>per Cent. | Calcu-<br>lated.                                               | Actual. | Difference<br>per Cent. | Calcu-<br>lated.                            | Actual. | Difference<br>per Cent. | Calcu-<br>lated. | Actual. | Difference<br>per Cent. |
| Under 15          | 37                                    | 90      | + 143.2                 | 28                                                             | 64      | + 128.6                 | 40                                          | 143     | + 257.5                 | 105              | 297     | + 182.9                 |
| 15 to 20          | 478                                   | 438     | - 8.4                   | 375                                                            | 370     | - 1.3                   | 513                                         | 519     | + 1.2                   | 1366             | 1327    | - 2.8                   |
| 20 ... 30         | 731                                   | 770     | + 5.3                   | 588                                                            | 671     | + 14.1                  | 785                                         | 843     | + 7.4                   | 2104             | 2284    | + 8.5                   |
| 30 ... 40         | 295                                   | 291     | - 1.4                   | 235                                                            | 282     | + 20.0                  | 311                                         | 339     | + 9.0                   | 841              | 912     | + 8.4                   |
| 40 ... 50         | 165                                   | 174     | + 5.5                   | 124                                                            | 145     | + 16.9                  | 169                                         | 188     | + 11.2                  | 458              | 507     | + 10.7                  |
| 50 ... 60         | 64                                    | 69      | + 7.8                   | 48                                                             | 59      | + 22.9                  | 71                                          | 89      | + 25.3                  | 183              | 217     | + 18.6                  |
| 60 and upwards    | 40                                    | 38      | - 5.0                   | 29                                                             | 32      | + 10.3                  | 43                                          | 51      | + 18.6                  | 112              | 121     | + 7.1                   |
| Total . . .       | 1810                                  | 1870    | + 3.3                   | 1427                                                           | 1623    | + 13.7                  | 1932                                        | 2172    | + 12.4                  | 5169             | 5665    | + 9.6                   |
| Population . .    |                                       | 556197  |                         |                                                                | 431657  |                         |                                             | 591425  |                         |                  | 1579279 |                         |
| Proportion ;—1 in |                                       | 307-297 |                         |                                                                | 302-265 |                         |                                             | 306-272 |                         |                  | 305-279 |                         |



must exhibit the most striking contrast between each other in respect to their manufacturing and agricultural populations. If then the predominance of either the one or the other interest has any influence on the amount of crime, it should manifest itself in the results of these two groups; but it will appear that the actual crime in the last of these groups also exceeds the average of the whole kingdom; the excess being 4·2 per cent.; and although this difference falls somewhat short of the other, it is not of so marked a nature as to demand further investigation.

Carrying out the same mode of classification, Group 7 has been formed of the seven counties in England and Wales, in which the manufacturing and agricultural interests were as nearly as possible equal, in no instance differing by more than ·6 per cent.; and it is somewhat remarkable to find that in this case the excess of crime is 4·5 per cent., differing from the result in the preceding group by only ·3 per cent. It is therefore evident that the mere fact of the difference in the habits and condition of agriculturists and manufacturers can have very little to do with the increase or decrease of crime, and that some other solution of the very great disparity found to prevail between particular districts must be sought for. The following Abstract shews the difference per cent. between the actual amount of crime in each of the districts or groups of Table XIV, and the average for the whole of England and Wales:—

## MALES.

| GROUP.                                                         | Average Crime. |         | Actual Crime. |         | Difference per Cent. |         |
|----------------------------------------------------------------|----------------|---------|---------------|---------|----------------------|---------|
|                                                                | 1842—4.        | 1845—8. | 1842—4.       | 1845—8. | 1842—4.              | 1845—8. |
| 1. Lowest Ratio of Agriculturists . . . . .                    | 4934·86        | 4626    | 5163          | 4535    | + 4·6                | — 2·0   |
| 2. Highest Ratio of Ditto . . . . .                            | 3009·05        | 3045    | 3150          | 3338    | + 4·6                | + 9·6   |
| 3. Highest Ratio of Manufacturers . . . . .                    | 3053·01        | 2828    | 3593          | 3915    | + 17·7               | + 38·4  |
| 4. Lowest Ratio of Ditto . . . . .                             | 2001·25        | 1772    | 1941          | 1782    | — 2·9                | + ·6    |
| 5. Manufacturers, 33 $\frac{1}{3}$ per cent. above the average | 3897·17        | 3621    | 4321          | 3779    | + 10·8               | + 4·4   |
| 6. Agriculturists, 50 per cent. above the average .            | 3411·13        | 3024    | 3555          | 3257    | + 4·2                | + 7·7   |
| 7. Agriculturists and Manufacturers nearly equal .             | 2348·68        | 2086    | 2456          | 2198    | + 4·5                | + 5·4   |
| 8. Greatest Wealth . . . . .                                   | 2527·31        | 2261    | 2303          | 2300    | — 8·8                | + 1·7   |
| 9. Least Wealth . . . . .                                      | 2541·67        | 2334    | 2512          | 2136    | — 1·1                | — 8·5   |

The preceding combinations so far as relates to the period 1842—4 have shewn that in the least as well as in the most agricultural districts the excess of crime was precisely equal, namely, 4·6 per cent. It was likewise seen that in the districts in which there is the highest average of manufacturers, as well as that in which there is the highest average of agriculturists, and also that in which the two interests are equal, the tendency to crime differs very little. It may therefore be safely concluded that neither of them gives any clue to work out the problem—What is the element or feature in the condition of life and social state of society which produces in one great community an excess of crime amounting to 52·1 per cent. above the average, and in another community reduces crime below the average 33·5 per cent.?

Another argument usually adduced in explanation of the greater or less prevalence  
[of crime,



TABLE XIV.

1842-4.

*Difference between the Actual Amount of Crime in each District, and the Average for England and Wales.—Males.*

## GROUP 1.

In England and Wales the average ratio of Agriculturists to the whole Population is 7·9 per cent. In the following there is the lowest average of Agriculturists.

| COUNTIES.                | Ratio of Agriculturists. | Calculated Average. | Actual Crime. |
|--------------------------|--------------------------|---------------------|---------------|
| Lancaster . . . . .      | 3·0                      | 2574·67             | 2802          |
| Durham . . . . .         | 4·4                      | 492·08              | 248           |
| Surrey . . . . .         | 4·4                      | 844·16              | 728           |
| Stafford . . . . .       | 5·7                      | 790·62              | 962           |
| Warwick . . . . .        | 6·0                      | 597·08              | 825           |
| Monmouth . . . . .       | 6·5                      | 231·62              | 201           |
| Chester . . . . .        | 6·7                      | 590·57              | 792           |
| Northumberland . . . . . | 6·9                      | 371·63              | 197           |
| Derby . . . . .          | 7·1                      | 406·63              | 276           |
| Gloucester . . . . .     | 7·2                      | 610·47              | 932           |
|                          |                          |                     |               |
| Lancaster . . . . .      | ...                      | 7509·53             | 7965          |
|                          |                          | 2574·67             | 2802          |
|                          |                          | 4934·86             | 5163          |

## GROUP 2.

Highest average of Agriculturists.

| COUNTIES.           | Ratio of Agriculturists. | Calculated Average. | Actual Crime. |
|---------------------|--------------------------|---------------------|---------------|
| Lincoln . . . . .   | 15·9                     | 542·52              | 433           |
| Rutland . . . . .   | 15·6                     | 30·88               | 31            |
| Essex . . . . .     | 14·8                     | 505·46              | 589           |
| Hereford . . . . .  | 14·6                     | 167·80              | 197           |
| Hants . . . . .     | 14·5                     | 87·50               | 58            |
| Wilts . . . . .     | 14·1                     | 376·78              | 424           |
| Bucks . . . . .     | 14·0                     | 151·30              | 184           |
| Bedford . . . . .   | 13·8                     | 222·36              | 263           |
| Berks . . . . .     | 13·2                     | 236·77              | 251           |
| Cambridge . . . . . | 13·0                     | 245·01              | 228           |
| Suffolk . . . . .   | 13·9                     | 424·67              | 492           |
|                     |                          | 3009·05             | 3150          |

## GROUP 3.

In England and Wales the average ratio of Manufacturers to the whole Population is 16·5 per cent. In the following Counties there is the highest average of Manufacturers.

| COUNTIES.                         | Ratio of Manufacturers. | Calculated Average. | Actual Crime. |
|-----------------------------------|-------------------------|---------------------|---------------|
| Lancaster . . . . .               | 28·1                    | 2574·67             | 2802          |
| Chester . . . . .                 | 23·5                    | 590·57              | 792           |
| Warwick . . . . .                 | 21·9                    | 597·08              | 825           |
| Notts . . . . .                   | 20·6                    | 356·19              | 307           |
| Middlesex . . . . .               | 20·0                    | 2394·51             | 3076          |
| Leicester . . . . .               | 19·2                    | 311·92              | 431           |
| Derby . . . . .                   | 18·9                    | 406·63              | 276           |
| Stafford . . . . .                | 18·7                    | 790·62              | 962           |
|                                   |                         |                     |               |
| Lancaster and Middlesex . . . . . | ...                     | 8022·19             | 9471          |
|                                   |                         | 4969·18             | 5878          |
|                                   |                         | 3053·01             | 3593          |



TABLE XIV.—MALES.—(continued.)

## GROUP 4.

Lowest average of Manufacturers.

| COUNTIES.            | Ratio of Manufacturers. | Calculated Average. | Actual Crime. |
|----------------------|-------------------------|---------------------|---------------|
| Cambridge . . . . .  | 8.9                     | 245.01              | 228           |
| Huntingdon . . . . . | 9.2                     | 87.50               | 58            |
| Rutland . . . . .    | 9.2                     | 30.88               | 31            |
| Essex . . . . .      | 9.3                     | 505.46              | 589           |
| Lincoln . . . . .    | 9.6                     | 542.52              | 433           |
| Sussex . . . . .     | 9.7                     | 422.08              | 405           |
| Hereford . . . . .   | 9.8                     | 167.80              | 197           |
|                      |                         | 2001.25             | 1941          |

## GROUP 5.

The average ratio of Agriculturists to Manufacturers in England and Wales is 7.9 to 16.5; difference = 8.6.

In the following Counties the Manufacturers are above the average difference by  $33\frac{1}{3}$  per cent.

| COUNTIES.                         | Agricultural Ratio. | Manufacturing Ratio. | Difference. | Calculated Average. | Actual Crime. |
|-----------------------------------|---------------------|----------------------|-------------|---------------------|---------------|
| Chester . . . . .                 | 6.7                 | 23.5                 | 16.9        | 590.57              | 792           |
| Derby . . . . .                   | 7.1                 | 18.9                 | 11.8        | 406.63              | 276           |
| Lancaster . . . . .               | 8.0                 | 28.1                 | 25.1        | 2574.67             | 2802          |
| Middlesex . . . . .               | 1.1                 | 20.0                 | 18.9        | 2394.51             | 3076          |
| Warwick . . . . .                 | 6.0                 | 21.9                 | 15.9        | 597.08              | 825           |
| Stafford . . . . .                | 5.7                 | 18.7                 | 13.0        | 790.62              | 962           |
| Notts . . . . .                   | 8.2                 | 20.6                 | 12.4        | 356.19              | 307           |
| Surrey . . . . .                  | 4.4                 | 16.2                 | 11.8        | 844.16              | 728           |
| Leicester . . . . .               | 7.9                 | 19.2                 | 11.3        | 311.92              | 431           |
|                                   |                     |                      |             | 8866.35             | 10199         |
| Lancaster and Middlesex . . . . . | ...                 | ...                  | ...         | 4969.18             | 5878          |
|                                   |                     |                      |             | 3897.17             | 4321          |

## GROUP 6.

In the following Counties the Agriculturists are above the average ratio by at least double the whole average difference.

| COUNTIES.           | Agricultural Ratio. | Manufacturing Ratio. | Difference. | Calculated Average. | Actual Crime. |
|---------------------|---------------------|----------------------|-------------|---------------------|---------------|
| Bucks . . . . .     | 14.0                | 12.6                 | 1.4         | 222.36              | 263           |
| Bedford . . . . .   | 13.8                | 10.7                 | 3.1         | 151.30              | 184           |
| Sussex . . . . .    | 11.9                | 9.7                  | 2.2         | 422.08              | 405           |
| Berks . . . . .     | 13.2                | 10.2                 | 3.0         | 236.77              | 251           |
| Wilts . . . . .     | 14.1                | 10.8                 | 3.3         | 376.78              | 424           |
| Suffolk . . . . .   | 13.9                | 10.0                 | 3.9         | 422.67              | 492           |
| Hereford . . . . .  | 14.6                | 9.9                  | 4.7         | 167.80              | 197           |
| Cambridge . . . . . | 13.9                | 8.9                  | 5.0         | 245.01              | 228           |
| Hunts . . . . .     | 14.5                | 9.2                  | 5.3         | 87.50               | 58            |
| Essex . . . . .     | 14.8                | 9.3                  | 5.5         | 505.46              | 589           |
| Lincoln . . . . .   | 15.9                | 9.6                  | 6.3         | 542.52              | 433           |
| Rutland . . . . .   | 15.6                | 9.2                  | 6.4         | 30.88               | 31            |
|                     |                     |                      |             | 3411.13             | 3555          |



TABLE XIV.—MALES.—(*continued.*)

## GROUP 7.

Counties in which the Agricultural and Manufacturing interests are nearly equal.

| COUNTIES.             | Agricultural Ratio. | Manufacturing Ratio. | Difference. | Calculated Average. | Actual Crime. |
|-----------------------|---------------------|----------------------|-------------|---------------------|---------------|
| Bedford . . . . .     | 13.8                | 13.3                 | +0.5        | 151.30              | 184           |
| Dorset . . . . .      | 10.9                | 11.1                 | —0.3        | 234.72              | 183           |
| Hertford . . . . .    | 12.8                | 12.8                 | 0.0         | 229.57              | 258           |
| Norfolk . . . . .     | 12.2                | 11.8                 | +0.4        | 557.46              | 661           |
| Northampton . . . . . | 12.9                | 13.5                 | —0.6        | 295.45              | 261           |
| Salop . . . . .       | 11.7                | 11.9                 | —0.2        | 358.25              | 399           |
| Southampton . . . . . | 10.0                | 10.6                 | —0.6        | 521.93              | 510           |
|                       |                     |                      |             | 2348.68             | 2456          |

## GROUP 8.

In England and Wales the average proportion of persons of independent means = 2.8 per cent. In the following Counties the proportion is at least 33 per cent. above the average.

| COUNTIES.              | Ratio. | Calculated Average. | Actual Crime. |
|------------------------|--------|---------------------|---------------|
| Surrey . . . . .       | 4.2    | 844.16              | 728           |
| Westmoreland . . . . . | 4.0    | 84.41               | 27            |
| Devon . . . . .        | 3.8    | 732.97              | 535           |
| Cumberland . . . . .   | 3.7    | 255.30              | 81            |
| Gloucester . . . . .   | 3.7    | 610.47              | 932           |
|                        |        | 2527.31             | 2303          |

## GROUP 9.

Counties in which the proportion is 33 per cent. less than the average.

| COUNTIES.             | Ratio. | Calculated Average. | Actual Crime. |
|-----------------------|--------|---------------------|---------------|
| Bedford . . . . .     | 1.6    | 151.30              | 184           |
| Stafford . . . . .    | 1.6    | 790.62              | 962           |
| Derby . . . . .       | 1.9    | 406.63              | 276           |
| Monmouth . . . . .    | 1.9    | 231.62              | 201           |
| Northampton . . . . . | 1.9    | 295.45              | 261           |
| Nottingham . . . . .  | 1.9    | 356.19              | 307           |
| Bucks . . . . .       | 2.0    | 222.36              | 263           |
| Hunts . . . . .       | 2.0    | 87.50               | 58            |
|                       |        | 2541.67             | 2512          |



TABLE XV.

1845-8.

*Difference between the Actual Amount of Crime in each District, and the Average for England and Wales.—Males.*

## GROUP 1.

In England and Wales the average ratio of Agriculturists to the whole Population is 7·9 per cent. In the following there is the lowest average of Agriculturists.

| COUNTIES.                | Ratio of Agriculturists. | Calculated Average. | Actual Crime. |
|--------------------------|--------------------------|---------------------|---------------|
| Lancaster . . . . .      | 3·0                      | 2511                | 2423          |
| Durham . . . . .         | 4·4                      | 479                 | 203           |
| Surrey . . . . .         | 4·4                      | 793                 | 864           |
| Stafford . . . . .       | 5·7                      | 754                 | 719           |
| Warwick . . . . .        | 6·0                      | 560                 | 778           |
| Monmouth . . . . .       | 6·5                      | 234                 | 193           |
| Chester . . . . .        | 6·7                      | 558                 | 657           |
| Northumberland . . . . . | 6·9                      | 336                 | 139           |
| Derby . . . . .          | 7·1                      | 364                 | 199           |
| Gloucester . . . . .     | 7·2                      | 548                 | 783           |
| <hr/>                    |                          |                     |               |
| Lancaster . . . . .      | ...                      | 7137                | 6958          |
|                          |                          | 2511                | 2423          |
| <hr/>                    |                          |                     |               |
|                          |                          | 4626                | 4535          |

## GROUP 2.

Highest average of Agriculturists.

| COUNTIES.           | Ratio of Agriculturists. | Calculated Average. | Actual Crime. |
|---------------------|--------------------------|---------------------|---------------|
| Lincoln . . . . .   | 15·9                     | 485                 | 365           |
| Rutland . . . . .   | 15·6                     | 27                  | 31            |
| Essex . . . . .     | 14·8                     | 444                 | 529           |
| Hereford . . . . .  | 14·6                     | 145                 | 171           |
| Hants . . . . .     | 14·5                     | 473                 | 550           |
| Wilts . . . . .     | 14·1                     | 330                 | 378           |
| Bucks . . . . .     | 14·0                     | 192                 | 289           |
| Bedford . . . . .   | 13·8                     | 134                 | 159           |
| Berks . . . . .     | 13·2                     | 211                 | 256           |
| Cambridge . . . . . | 13·9                     | 222                 | 217           |
| Suffolk . . . . .   | 13·9                     | 382                 | 393           |
| <hr/>               |                          |                     |               |
|                     |                          | 3045                | 3338          |

## GROUP 3.

In England and Wales the average ratio of Manufacturers to the whole Population is 16·5 per cent. In the following Counties there is the highest average of Manufacturers.

| COUNTIES.                         | Ratio of Manufacturers. | Calculated Average. | Actual Crime. |
|-----------------------------------|-------------------------|---------------------|---------------|
| Lancaster . . . . .               | 28·1                    | 2511                | 2423          |
| Chester . . . . .                 | 23·5                    | 558                 | 657           |
| Warwick . . . . .                 | 21·9                    | 560                 | 778           |
| Nottingham . . . . .              | 20·6                    | 318                 | 267           |
| Middlesex . . . . .               | 20·0                    | 2218                | 3558          |
| Leicester . . . . .               | 19·2                    | 274                 | 295           |
| Derby . . . . .                   | 18·9                    | 364                 | 199           |
| Stafford . . . . .                | 18·7                    | 754                 | 719           |
| <hr/>                             |                         |                     |               |
| Lancaster and Middlesex . . . . . | ...                     | 7557                | 8896          |
|                                   |                         | 4729                | 4981          |
| <hr/>                             |                         |                     |               |
|                                   |                         | 2828                | 3915          |



TABLE XV.—MALES.—(*continued.*)

## GROUP 4.

Lowest average of Manufacturers.

| COUNTIES.            | Ratio of Manufacturers. | Calculated Average. | Actual Crime. |
|----------------------|-------------------------|---------------------|---------------|
| Cambridge . . . . .  | 8.9                     | 222                 | 217           |
| Huntingdon . . . . . | 9.2                     | 75                  | 74            |
| Rutland . . . . .    | 9.2                     | 27                  | 31            |
| Essex . . . . .      | 9.3                     | 444                 | 529           |
| Lincoln . . . . .    | 9.6                     | 485                 | 365           |
| Sussex . . . . .     | 9.7                     | 374                 | 395           |
| Hereford . . . . .   | 9.8                     | 145                 | 171           |
|                      |                         | 1772                | 1782          |

## GROUP 5.

The average ratio of Agriculturists to Manufacturers in England and Wales is 7.9 to 16.5; diff. = 8.6. In the following Counties the Manufacturers are above the average difference by  $33\frac{1}{3}$  per cent.

| COUNTIES.             | Agricultural Ratio. | Manufacturing Ratio. | Difference. | Calculated Average. | Actual Crime. |
|-----------------------|---------------------|----------------------|-------------|---------------------|---------------|
| Chester . . . . .     | 6.7                 | 23.5                 | 16.9        | 558                 | 657           |
| Derby . . . . .       | 7.1                 | 18.9                 | 11.8        | 364                 | 199           |
| Lancaster . . . . .   | 3.0                 | 28.1                 | 25.1        | 2511                | 2423          |
| Middlesex . . . . .   | 1.1                 | 20.0                 | 18.9        | 2218                | 3558          |
| Warwick . . . . .     | 6.0                 | 21.9                 | 15.9        | 560                 | 778           |
| Stafford . . . . .    | 5.7                 | 18.7                 | 13.0        | 754                 | 719           |
| Nottingham . . . . .  | 8.2                 | 20.6                 | 12.4        | 318                 | 267           |
| Surrey . . . . .      | 4.4                 | 16.2                 | 11.8        | 793                 | 864           |
| Leicester . . . . .   | 7.9                 | 19.2                 | 11.3        | 274                 | 295           |
|                       |                     |                      |             | 8350                | 9760          |
| Lancaster & Middlesex | ...                 | ...                  | ...         | 4729                | 5981          |
|                       |                     |                      |             | 3621                | 3779          |

## GROUP 6.

In the following Counties the Agriculturists are above the average ratio by at least double the whole average difference.

| COUNTIES.           | Agricultural Ratio. | Manufacturing Ratio. | Difference. | Calculated Average. | Actual Crime. |
|---------------------|---------------------|----------------------|-------------|---------------------|---------------|
| Bucks . . . . .     | 14.0                | 12.6                 | 1.4         | 192                 | 289           |
| Bedford . . . . .   | 13.8                | 10.7                 | 3.1         | 134                 | 159           |
| Sussex . . . . .    | 11.9                | 9.7                  | 2.2         | 377                 | 395           |
| Berks . . . . .     | 13.2                | 10.2                 | 3.0         | 211                 | 256           |
| Wilts . . . . .     | 14.1                | 10.8                 | 3.3         | 330                 | 378           |
| Suffolk . . . . .   | 13.9                | 10.0                 | 3.9         | 382                 | 393           |
| Hereford . . . . .  | 14.6                | 9.9                  | 4.7         | 145                 | 171           |
| Cambridge . . . . . | 13.9                | 8.9                  | 5.0         | 222                 | 217           |
| Hunts . . . . .     | 14.5                | 9.2                  | 5.3         | 75                  | 74            |
| Essex . . . . .     | 14.8                | 9.3                  | 5.5         | 444                 | 529           |
| Lincoln . . . . .   | 15.9                | 9.6                  | 6.3         | 485                 | 365           |
| Rutland . . . . .   | 15.6                | 9.2                  | 6.4         | 27                  | 31            |
|                     |                     |                      |             | 3024                | 3257          |



TABLE XV.—MALES.—(*continued.*)

## GROUP 7.

Counties in which the Agricultural and Manufacturing interests are nearly equal.

| COUNTIES.             | Agricultural Ratio. | Manufacturing Ratio. | Difference. | Calculated Average. | Actual Crime. |
|-----------------------|---------------------|----------------------|-------------|---------------------|---------------|
| Bedford . . . . .     | 13·8                | 13·3                 | + 0·5       | 134                 | 159           |
| Dorset . . . . .      | 10·9                | 11·1                 | — 0·3       | 206                 | 210           |
| Hertford . . . . .    | 12·8                | 12·8                 | 0·0         | 200                 | 246           |
| Norfolk . . . . .     | 12·2                | 11·8                 | + 0·4       | 499                 | 583           |
| Northampton . . . . . | 12·9                | 13·5                 | — 0·6       | 263                 | 236           |
| Salop . . . . .       | 11·7                | 11·9                 | — 0·2       | 311                 | 214           |
| Southampton . . . . . | 10·0                | 10·6                 | — 0·6       | 473                 | 550           |
|                       |                     |                      |             | 2086                | 2198          |

## GROUP 8.

In England and Wales the average proportion of persons of independent means is = 2·8 per cent. In the following Counties the proportion is at least 33 per cent. above the average.

| COUNTIES.              | Ratio. | Calculated Average. | Actual Crime. |
|------------------------|--------|---------------------|---------------|
| Surrey . . . . .       | 4·2    | 793                 | 864           |
| Westmoreland . . . . . | 4·0    | 55                  | 43            |
| Devon . . . . .        | 3·8    | 643                 | 520           |
| Cumberland . . . . .   | 3·7    | 222                 | 90            |
| Gloucester . . . . .   | 3·7    | 548                 | 783           |
|                        |        | 2261                | 2300          |

## GROUP 9.

Counties in which the proportion is 33 per cent. less than the average.

| COUNTIES.             | Ratio. | Calculated Average. | Actual Crime. |
|-----------------------|--------|---------------------|---------------|
| Bedford . . . . .     | 1·6    | 134                 | 159           |
| Stafford . . . . .    | 1·6    | 754                 | 719           |
| Derby . . . . .       | 1·9    | 364                 | 199           |
| Monmouth . . . . .    | 1·9    | 234                 | 193           |
| Northampton . . . . . | 1·9    | 263                 | 236           |
| Nottingham . . . . .  | 1·9    | 318                 | 267           |
| Bucks . . . . .       | 2·0    | 192                 | 289           |
| Hunts . . . . .       | 2·0    | 75                  | 74            |
|                       |        | 2334                | 2136          |



of crime, is the comparative wealth or poverty of particular districts. No very exact means exist by which to determine in what districts or counties there is the highest or least proportion of wealth; but so far as means are available, an attempt has been made to test the value of the argument advanced.

In England and Wales, according to the census returns, the average ratio of persons of independent means is 2·8 per cent.; and by taking those counties as given in Group 8, in which the proportion is exceeded by at least 33 per cent., it will be found that the actual crime is below the average of the whole kingdom by 8·8 per cent.; but in connection with this, it is curious to observe the results of Group 9, which is made up of those counties in which the proportion of persons of independent means is 33 per cent. below the general average, for in that case also crime is below the average of the whole country, although to the extent of 1·1 per cent. only. No powerful or active element can therefore be traced in connection with this feature, sufficient to account for some of the widely different results already observed.

The preceding remarks have been made in respect to the results appearing in the sixth column of the Abstract given in page 346, and derived from Table XIV, but if attention be directed to column seven of the same Abstract, derived from Table XV, representing the results for the period 1845-8, it will be found that the same reasoning, with very slight modifications, will apply to nearly all the combinations.

In this country no satisfactory test can at this time be employed in order to discover those districts in which the people generally receive a greater or less degree of instruction. The Educational Returns, made in connection with the Census of 1851, as they relate to the younger portion of the population only, are not applicable: and perhaps the very best available test is that furnished by the returns of the Registrar-General. Under the New Marriage Act, every person married must sign the Marriage Register; and an abstract has been made for each county, shewing the number of persons signing the Register with their names, and the number signing with their marks; so that if the mere mechanical qualification of an individual being able to sign his name be regarded as evidence of the relative degree of education which he has received, it becomes possible to classify the several counties in England and Wales according to the degree of the education of its population. This test is of the more value because at that period of life at which the greatest amount of crime takes place, there is also the greatest number of marriages; and, consequently, both classes of facts will have a more immediate and direct relation to each other.

If the term education were held to signify the culture and elevation of the moral character, it is evident that its immediate and essential influence would be to destroy crime: in fact in this sense, education and freedom from crime must bear the relation to each other of cause and effect; and therefore when education is at a maximum, crime must of necessity be at a minimum; so that if the term be thus explained, statistical evidence would be *à priori* unnecessary to solve the problem proposed: but if the term education be used in its ordinary



acceptation, merely to imply instruction, it then becomes a fit and important question, whether education in this limited sense has any influence on the development of crime.

The proportion of the male population in England and Wales signing their marriage certificates with marks is 33 per cent. The first group in the following Table XVI is made up of those counties in which the proportion signing with marks exceeded the general average by at least 33·33 per cent., and may be called the counties of lowest degree of education. The second group in the same Table is composed of those counties in which the proportion is at least 25 per cent. under the average, and may be termed the group of highest degree of education. On comparing the results of these two groups, it is found that, during the period 1842-4, where there is the lowest degree of education, there is an excess of crime of 13·2 per cent.; but in the group of the highest degree of education the actual crime is 30·7 per cent. under the average of the whole kingdom, and during the years 1845-8, the corresponding results derived from Table XVII are an excess of crime of 14·6 per cent. in the group of lowest degree of education, but in the group of highest education crime is 21·0 per cent. below the average ratio for the kingdom. To this extent the influence of education is evident.

TABLE XVI.

1842-4.

In England and Wales 33 per cent. (Males) signed the Marriage Register by their *Marks*. In the following Counties the highest proportion did so, being all at least 33½ per cent. above the average.

## GROUP 1.

| COUNTIES.           | Ratio signing with their Marks. | Calculated Average. | Actual Crime. |
|---------------------|---------------------------------|---------------------|---------------|
| Hertford . . . . .  | 50                              | 229·57              | 258           |
| Monmouth . . . . .  | 51                              | 231·62              | 201           |
| Bedford . . . . .   | 49                              | 151·30              | 184           |
| Cambridge . . . . . | 47                              | 245·01              | 228           |
| Suffolk . . . . .   | 47                              | 442·67              | 492           |
| Essex . . . . .     | 47                              | 505·46              | 589           |
| Worcester . . . . . | 46                              | 337·66              | 516           |
| Hunts . . . . .     | 44                              | 87·50               | 58            |
|                     |                                 | 2230·79             | 2526          |

## GROUP 2.

Counties in which the lowest proportion signed with their *Marks*, being all at least 25 per cent. below the average.

| COUNTIES.                | Ratio signing with their Marks. | Calculated Average. | Actual Crime. |
|--------------------------|---------------------------------|---------------------|---------------|
| Bucks . . . . .          | 14                              | 222·36              | 263           |
| Cumberland . . . . .     | 16                              | 255·30              | 81            |
| Surrey . . . . .         | 17                              | 844·16              | 728           |
| Northumberland . . . . . | 18                              | 371·63              | 197           |
| Westmoreland . . . . .   | 20                              | 84·41               | 27            |
| Devon . . . . .          | 28                              | 732·97              | 535           |
| Durham . . . . .         | 26                              | 492·08              | 248           |
|                          |                                 | 3002·91             | 2079          |



TABLE XVII.

1845-8.

## GROUP 1.

In England and Wales 33 per cent. (Males) signed the Marriage Register by their *Marks*. In the following Counties the highest proportion did so, being all at least 33½ per cent. above the average.

| COUNTIES.           | Ratio signing with their Marks. | Calculated Average. | Actual Crime. |
|---------------------|---------------------------------|---------------------|---------------|
| Hertford . . . . .  | 50                              | 200                 | 246           |
| Monmouth . . . . .  | 51                              | 234                 | 193           |
| Bedford . . . . .   | 49                              | 134                 | 159           |
| Cambridge . . . . . | 47                              | 222                 | 217           |
| Suffolk . . . . .   | 47                              | 382                 | 393           |
| Essex . . . . .     | 47                              | 444                 | 529           |
| Worcester . . . . . | 46                              | 300                 | 471           |
| Hunts . . . . .     | 44                              | 75                  | 74            |
|                     |                                 | 1991                | 2282          |

## GROUP 2.

Counties in which the lowest proportion signed with their *Marks*, being all at least 25 per cent. below the average.

| COUNTIES.                | Ratio signing with their Marks. | Calculated Average. | Actual Crime. |
|--------------------------|---------------------------------|---------------------|---------------|
| Bucks . . . . .          | 14                              | 192                 | 289           |
| Cumberland . . . . .     | 16                              | 222                 | 90            |
| Surrey . . . . .         | 17                              | 793                 | 864           |
| Northumberland . . . . . | 18                              | 336                 | 139           |
| Westmoreland . . . . .   | 20                              | 55                  | 43            |
| Devon . . . . .          | 28                              | 643                 | 520           |
| Durham . . . . .         | 26                              | 479                 | 203           |
|                          |                                 | 2720                | 2148          |

But it may be held, that in the two groups now referred to, the difference in the amount of crime may be owing to the influence of some other element than simply education. So far as the subject is yet interrogated, it may be fairly said, that a high state of education is always found accompanied with a reduced rate of crime, and that a low state of education carries with it an increased amount of crime; but it still remains to be determined whether that difference may not arise through the agency of some other element. It may be argued that a high state of education is generally the concomitant of wealth, or a more advanced position in the social scale of society, and hence the reduced rate of crime; and that a low state of education is usually associated with a peculiar grade of employments and manufactures, subject to marked fluctuations in prosperity, exposing those engaged in them to deprivation, temptation, and vice, and thus directly increasing the amount of crime: a result which is falsely believed to have arisen from



want of education, instead of the poverty and distress co-existing with it. To try the strength of this objection, a still further analysis of the facts presented will be necessary.

If it were possible to arrange the several counties or districts in sections, so that when any two sections were compared, the communities composing them were as similarly as possible circumstanced in regard to manufactures, in regard to agriculture, in regard to wealth—in fact that the two differed from each other only in the degree of instruction or education—it might then be said, at least so far as statistical tests are at present available, that the two sections or classes compared were, with the exception of education, placed under exactly the same social and political conditions of society; and should the ratio of crime prevailing in those two districts differ from each other, the difference must of necessity arise from the difference existing in their degrees of education.

On referring to Table XVIII it will be seen that each group is composed of the same counties which formed the various classes or combinations in Table XIII; but it will be further seen that each of these groups is divided into two sections; the right-hand section of which—Section (*b*), will be found to contain those counties in which there is the highest degree of education—and the left-hand section, or Section (*a*), those counties with the least degree of education; and as the counties in each differ in respect of education only, the difference, if any, in the results of the respective sections of these groups will furnish the argument for or against the influence which education may have on the amount of crime.

In Group 1, Table XVIII, being the class of “least agricultural” counties, it will be found that in the section of least education there is an excess of 16·6 per cent. of crime; and excluding Lancashire, the excess of crime above the average of the country will be 25·8 per cent.; but in the section of most education the actual crime will be found under the average, at least 12·8 per cent. Again, in the group of “greatest agricultural” counties, there is an excess of 8·4 per cent. in the section of least education, and in the section of most education the excess of crime is only ·9 per cent.

In the third group, representing the “greatest manufacturing” counties, where there is least education, the excess of crime is 24·8 per cent., and excluding Lancashire, the excess is 48·4 per cent.; but in the section of highest education the excess is 24·2 per cent., and excluding Middlesex, the excess of crime is not more than 16·4 per cent. In the next group in order, that consisting of the “least manufacturing” counties, there is an excess of 4·3 with least education; and crime is 8·7 below the average where a higher degree of education prevails.

On referring, however, to Groups 5 and 6 of Table XVIII, more decidedly manufacturing and agricultural counties will be found, and in them very striking evidence of the influence of education will appear. In the manufacturing group it will be seen that in the section of least education crime is above the average 15·8 per cent.; but in the section of most education crime is below the average 7·2 per cent., and in the section  
[of least education



TABLE XVIII.

1842-4.

GROUP 1.

Shewing for the Group of least Agricultural Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Lancashire . . . .        | 38                        | 2574.67             | 2802          | Durham . . . . .          | 26                        | 492.08              | 248           |
| Stafford . . . . .        | 42                        | 790.62              | 962           | Surrey . . . . .          | 17                        | 844.16              | 728           |
| Monmouth . . . . .        | 51                        | 231.62              | 201           | Northumberland . .        | 18                        | 371.63              | 197           |
| Chester . . . . .         | 38                        | 590.57              | 792           | Derby . . . . .           | 30                        | 406.63              | 276           |
| Warwick . . . . .         | 32                        | 597.08              | 825           | Gloucester . . . .        | 28                        | 610.47              | 932           |
|                           |                           | 4784.56             | 5582          |                           |                           | 2724.97             | 2381          |
| Lancashire . . . .        | ...                       | 2574.67             | 2802          |                           |                           |                     |               |
|                           |                           | 2209.89             | 2780          |                           |                           |                     |               |

GROUP 2.

Greatest Agricultural Counties.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Bedford . . . . .         | 49                        | 222.36              | 263           | Bucks . . . . .           | 14                        | 151.30              | 184           |
| Essex . . . . .           | 47                        | 505.46              | 589           | Lincoln . . . . .         | 32                        | 542.52              | 433           |
| Cambridge . . . . .       | 47                        | 245.01              | 228           | Hereford . . . . .        | 38                        | 167.80              | 197           |
| Suffolk . . . . .         | 47                        | 442.67              | 492           | Rutland . . . . .         | 40                        | 30.88               | 31            |
| Hunts . . . . .           | 44                        | 87.50               | 58            | Berks . . . . .           | 41                        | 236.77              | 251           |
|                           |                           | 1503.00             | 1630          | Wilts . . . . .           | 43                        | 376.78              | 424           |
|                           |                           |                     |               |                           |                           | 1506.05             | 1520          |

GROUP 5.

Shewing for the Group of Greatest Manufacturing Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Stafford . . . . .        | 42                        | 790.62              | 962           | Middlesex . . . . .       | 12                        | 2394.51             | 3076          |
| Lancaster . . . . .       | 38                        | 2574.67             | 2802          | Derby . . . . .           | 30                        | 406.63              | 276           |
| Chester . . . . .         | 38                        | 590.57              | 792           | Leicester . . . . .       | 32                        | 311.92              | 431           |
| Notts . . . . .           | 33                        | 356.19              | 825           | Warwick . . . . .         | 32                        | 597.08              | 825           |
|                           |                           | 4312.05             | 5381          |                           |                           | 3710.14             | 4608          |
| Lancaster . . . .         | ...                       | 2574.67             | 2802          | Middlesex . . . .         | ...                       | 2394.51             | 3076          |
|                           |                           | 1737.38             | 2579          |                           |                           | 1315.63             | 1532          |



TABLE XVIII.—(continued.)

GROUP 4.  
Least Manufacturing Counties.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Cambridge . . . .         | 47                        | 245.01              | 228           | Sussex . . . . .          | 28                        | 422.08              | 405           |
| Essex . . . . .           | 47                        | 505.46              | 589           | Lincoln . . . . .         | 32                        | 544.52              | 433           |
| Huntingdon . . . .        | 44                        | 87.50               | 58            | Hereford . . . . .        | 38                        | 167.80              | 197           |
| Rutland . . . . .         | 40                        | 30.88               | 31            |                           |                           | 1134.40             | 1035          |
|                           |                           | 868.85              | 906           |                           |                           |                     |               |

## GROUP 5.

Shewing for the Group of Counties in which the Manufacturing Interest is  $33\frac{1}{2}$  per cent. above the Manufacturing Average, the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

| COUNTIES.<br>Section (a) | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|--------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                          | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Stafford . . . . .       | 42                        | 790.62              | 962           | Middlesex . . . . .       | 12                        | 2394.51             | 3076          |
| Chester . . . . .        | 38                        | 590.57              | 792           | Surrey . . . . .          | 17                        | 844.16              | 728           |
| Lancaster . . . . .      | 38                        | 2574.67             | 2802          | Derby . . . . .           | 30                        | 406.63              | 276           |
| Notts . . . . .          | 33                        | 356.19              | 307           | Leicester . . . . .       | 32                        | 311.92              | 431           |
| Warwick . . . . .        | 32                        | 597.08              | 825           |                           |                           | 3957.22             | 4511          |
|                          |                           | 4909.13             | 5688          | Middlesex . . . . .       | ...                       | 2394.51             | 3076          |
| Lancaster . . . . .      | ...                       | 2574.67             | 2802          |                           |                           | 1562.71             | 1435          |
|                          |                           | 2334.46             | 2886          |                           |                           |                     |               |

## GROUP 6.

In the following Counties the Agriculturists are above the ratio by at least double the whole average difference.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Bedford . . . . .         | 49                        | 151.30              | 184           | Bucks . . . . .           | 14                        | 222.36              | 263           |
| Suffolk . . . . .         | 47                        | 422.69              | 492           | Sussex . . . . .          | 28                        | 422.08              | 405           |
| Cambridge . . . . .       | 47                        | 245.01              | 228           | Lincoln . . . . .         | 32                        | 542.52              | 433           |
| Essex . . . . .           | 47                        | 505.46              | 589           | Hereford . . . . .        | 38                        | 167.80              | 197           |
| Hunts . . . . .           | 44                        | 87.50               | 58            | Rutland . . . . .         | 40                        | 30.88               | 31            |
| Wilts . . . . .           | 43                        | 376.78              | 424           | Berks . . . . .           | 41                        | 236.77              | 251           |
|                           |                           | 1788.74             | 1975          |                           |                           | 1622.41             | 1580          |



TABLE XVIII.—(continued.)

## GROUP 7.

Shewing for the Group of Counties in which the Agricultural and Manufacturing Interests are nearly equal, the amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with their *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Hereford . . . .          | 50                        | 229.57              | 258           | Dorset . . . .            | 30                        | 234.72              | 183           |
| Bedford . . . .           | 49                        | 151.30              | 184           | Southampton . . .         | 32                        | 521.93              | 510           |
| Norfolk . . . .           | 42                        | 557.46              | 661           | Northampton . . .         | 28                        | 295.45              | 261           |
| Salop . . . .             | 41                        | 358.25              | 399           |                           |                           | 1052.10             | 954           |
|                           |                           | 1296.58             | 1502          |                           |                           |                     |               |

## GROUP 8.

Shewing for the Group of most Wealthy Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with their *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Devon . . . .             | 28                        | 732.97              | 535           | Cumberland . . .          | 16                        | 255.30              | 81            |
| Gloucester . . .          | 28                        | 610.47              | 932           | Surrey . . . .            | 17                        | 844.16              | 728           |
|                           |                           | 1343.44             | 1467          | Westmoreland . .          | 20                        | 84.41               | 27            |
|                           |                           |                     |               |                           |                           | 1183.87             | 836           |

## GROUP 9.

## Counties of Least Wealth.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Monmouth . . . .          | 51                        | 231.62              | 201           | Bucks . . . .             | 14                        | 222.36              | 263           |
| Bedford . . . .           | 49                        | 151.30              | 184           | Derby . . . .             | 30                        | 406.63              | 276           |
| Hunts . . . .             | 44                        | 87.50               | 58            | Nottingham . . .          | 33                        | 356.19              | 307           |
| Stafford . . . .          | 42                        | 790.62              | 962           | Northampton . . .         | 38                        | 295.45              | 261           |
|                           |                           | 1261.04             | 1405          |                           |                           | 1280.63             | 1107          |



TABLE XIX.

1845-8.

## GROUP 1.

Shewing for the Group of least Agricultural Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Lancashire . . . .        | 38                        | 2511                | 2423          | Durham . . . . .          | 26                        | 479                 | 203           |
| Stafford . . . . .        | 42                        | 754                 | 719           | Surrey . . . . .          | 17                        | 793                 | 864           |
| Monmouth . . . . .        | 51                        | 234                 | 193           | Northumberland .          | 18                        | 336                 | 139           |
| Chester . . . . .         | 38                        | 558                 | 657           | Derby . . . . .           | 30                        | 364                 | 199           |
| Warwick . . . . .         | 32                        | 560                 | 778           | Gloucester . . . .        | 28                        | 548                 | 783           |
|                           |                           | 4617                | 4770          |                           |                           | 2520                | 2188          |
| Lancashire . . . .        | ...                       | 2511                | 2423          |                           |                           |                     |               |
|                           |                           | 2106                | 2347          |                           |                           |                     |               |

## GROUP 2.

## Greatest Agricultural Counties.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Bedford . . . . .         | 49                        | 134                 | 159           | Bucks . . . . .           | 14                        | 192                 | 289           |
| Essex . . . . .           | 47                        | 444                 | 529           | Lincoln . . . . .         | 32                        | 485                 | 365           |
| Cambridge . . . . .       | 47                        | 222                 | 217           | Hereford . . . . .        | 38                        | 145                 | 171           |
| Suffolk . . . . .         | 47                        | 382                 | 393           | Rutland . . . . .         | 40                        | 27                  | 31            |
| Hunts . . . . .           | 44                        | 75                  | 74            | Berks . . . . .           | 41                        | 211                 | 256           |
|                           |                           | 1257                | 1372          | Wilts . . . . .           | 43                        | 330                 | 378           |
|                           |                           |                     |               |                           |                           | 1390                | 1490          |

## GROUP 3.

Shewing for the Group of greatest Manufacturing Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Stafford . . . . .        | 42                        | 754                 | 719           | Middlesex . . . . .       | 12                        | 2218                | 3558          |
| Lancaster . . . . .       | 38                        | 2511                | 2423          | Derby . . . . .           | 30                        | 364                 | 199           |
| Chester . . . . .         | 38                        | 558                 | 657           | Leicester . . . . .       | 32                        | 274                 | 295           |
| Notts . . . . .           | 33                        | 318                 | 267           | Warwick . . . . .         | 32                        | 560                 | 778           |
|                           |                           | 4141                | 4066          |                           |                           | 3416                | 4830          |
| Lancaster . . . .         | ...                       | 2511                | 2423          | Middlesex . . . . .       | ...                       | 2218                | 3558          |
|                           |                           | 1630                | 1643          |                           |                           | 1198                | 1272          |



TABLE XIX.—(continued.)

## GROUP 4.

## Least Manufacturing Counties.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Cambridge . . . .         | 47                        | 222                 | 217           | Sussex . . . . .          | 28                        | 377                 | 395           |
| Essex . . . . .           | 47                        | 444                 | 529           | Lincoln . . . . .         | 32                        | 485                 | 365           |
| Hunts . . . . .           | 44                        | 75                  | 74            | Hereford . . . . .        | 38                        | 145                 | 171           |
| Rutland . . . . .         | 40                        | 27                  | 31            |                           |                           |                     |               |
|                           |                           | 768                 | 851           |                           |                           | 1007                | 931           |

## GROUP 5.

Shewing for the Group of Counties in which the Manufacturing Interest is  $33\frac{1}{3}$  per cent. above the Manufacturing Average, the amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Stafford . . . . .        | 42                        | 754                 | 719           | Middlesex . . . . .       | 12                        | 2218                | 3558          |
| Chester . . . . .         | 38                        | 558                 | 657           | Surrey . . . . .          | 17                        | 793                 | 864           |
| Lancaster . . . . .       | 38                        | 2511                | 2423          | Derby . . . . .           | 30                        | 364                 | 199           |
| Notts . . . . .           | 33                        | 318                 | 267           | Leicester . . . . .       | 32                        | 274                 | 295           |
| Warwick . . . . .         | 32                        | 560                 | 778           |                           |                           |                     |               |
|                           |                           | 4701                | 4844          | Middlesex . . . . .       | ...                       | 3649                | 4916          |
| Lancaster . . . . .       | ...                       | 2511                | 2423          |                           |                           | 2218                | 3558          |
|                           |                           | 2190                | 2421          |                           |                           | 1431                | 1358          |

## GROUP 6.

In the following Counties the Agriculturists are above the ratio by at least double the whole average difference.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Bedford . . . . .         | 49                        | 134                 | 159           | Bucks . . . . .           | 14                        | 211                 | 256           |
| Suffolk . . . . .         | 47                        | 382                 | 393           | Sussex . . . . .          | 28                        | 377                 | 395           |
| Cambridge . . . . .       | 47                        | 222                 | 217           | Lincoln . . . . .         | 32                        | 485                 | 365           |
| Essex . . . . .           | 47                        | 444                 | 529           | Hereford . . . . .        | 38                        | 145                 | 171           |
| Hunts . . . . .           | 44                        | 75                  | 74            | Rutland . . . . .         | 40                        | 27                  | 31            |
| Wilts . . . . .           | 43                        | 330                 | 378           | Berks . . . . .           | 41                        | 211                 | 256           |
|                           |                           | 1587                | 1750          |                           |                           | 1456                | 1474          |



TABLE XIX.—(continued.)

## GROUP 7.

Shewing for the Group of Counties in which the Agricultural and Manufacturing Interests are nearly equal, the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with their *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Hereford . . . .          | 50                        | 145                 | 171           | Dorset . . . . .          | 30                        | 206                 | 210           |
| Bedford . . . . .         | 49                        | 134                 | 159           | Southampton . . .         | 32                        | 473                 | 550           |
| Norfolk . . . . .         | 42                        | 499                 | 583           | Northampton . . .         | 28                        | 263                 | 236           |
| Salop . . . . .           | 41                        | 311                 | 214           |                           |                           | 942                 | 996           |
|                           |                           | 1089                | 1127          |                           |                           |                     |               |

## GROUP 8.

Shewing for the Group of most Wealthy Counties the Amount of Crime in those Counties in which the greatest and also the least proportion signed their Marriage Certificates with their *Marks*.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Devon . . . . .           | 28                        | 643                 | 520           | Cumberland . . . .        | 16                        | 222                 | 90            |
| Gloucester . . . .        | 28                        | 548                 | 783           | Surrey . . . . .          | 17                        | 793                 | 864           |
|                           |                           | 1191                | 1303          | Westmoreland . . .        | 20                        | 55                  | 43            |
|                           |                           |                     |               |                           |                           | 1070                | 997           |

## GROUP 9.

## Counties of Least Wealth.

| COUNTIES.<br>Section (a). | Highest Proportion.       |                     |               | COUNTIES.<br>Section (b). | Lowest Proportion.        |                     |               |
|---------------------------|---------------------------|---------------------|---------------|---------------------------|---------------------------|---------------------|---------------|
|                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |                           | Ratio signing with Marks. | Calculated Average. | Actual Crime. |
| Monmouth . . . .          | 51                        | 234                 | 193           | Bucks . . . . .           | 14                        | 192                 | 289           |
| Bedford . . . . .         | 49                        | 134                 | 159           | Derby . . . . .           | 30                        | 364                 | 199           |
| Hunts . . . . .           | 44                        | 75                  | 74            | Nottingham . . . .        | 33                        | 318                 | 267           |
| Stafford . . . . .        | 42                        | 754                 | 719           | Northampton . . .         | 38                        | 263                 | 236           |
|                           |                           | 1197                | 1145          |                           |                           | 1137                | 991           |



of least education, if Lancaster be excluded, the excess of crime will be 23·2 per cent. Again, in the decidedly agricultural counties, with the lowest grade of education crime is in excess 10·4 per cent. ; but with the higher scale of education, there is less crime than the average of the country by 2·6 per cent. In the 7th group of the same Table, containing the counties in which the manufacturing and agricultural interests are nearly equal, it will be found to bear similar evidence to the influence of education on crime. For with the inferior degree of education there is an excess of crime of 15·8 per cent. ; but with the comparatively higher degree of instruction, crime is 9·3 per cent. below the average.

The 8th and 9th groups in Table XVIII furnish a still more remarkable proof of the same principle. On referring to Table XII, it will be found that crime in both of these groups was below the average of the whole kingdom ; but here, when sub-divided according to the means of education, it is found in the group of greatest wealth that the section of least education shews an excess of crime amounting to 9·2 per cent., and that the section of most education is 29·4 per cent. below the average in crime. The results for the group of least wealth go to establish the same fact ; there being an excess of 11·3 per cent. with the least degree of education, and with the best education a less amount of crime than the average by 13·5 per cent.

It is thus found that in every instance an increase of crime is associated with a low state of education ; but where a better state of education prevails, there is as constantly found to be a less amount of crime. The following Abstracts will give a condensed view of the results obtained from Table XVIII.

| GROUP OF COUNTIES.                                             | Inferior Degree of Education. |         |               |         | Higher Degree of Education. |         |               |         |
|----------------------------------------------------------------|-------------------------------|---------|---------------|---------|-----------------------------|---------|---------------|---------|
|                                                                | Calculated Crime.             |         | Actual Crime. |         | Calculated Crime.           |         | Actual Crime. |         |
|                                                                | 1842—4.                       | 1845—8. | 1842—4.       | 1845—8. | 1842—4.                     | 1845—8. | 1842—4.       | 1845—8. |
| Least Agricultural . . . . .                                   | 2209·89                       | 2106    | 2780          | 2347    | 2724·97                     | 2520    | 2381          | 2188    |
| Greatest ditto . . . . .                                       | 1503·00                       | 1257    | 1630          | 1372    | 1506·05                     | 1390    | 1520          | 1490    |
| Greatest Manufacturing . . . . .                               | 1737·38                       | 1630    | 2579          | 1643    | 1315·63                     | 1198    | 1532          | 1272    |
| Least ditto . . . . .                                          | 868·85                        | 768     | 906           | 851     | 1134·40                     | 1007    | 1035          | 931     |
| Manufacturing interest, 33½ }<br>per cent. above the average } | 2334·46                       | 2190    | 2886          | 2421    | 1562·71                     | 1431    | 1435          | 1358    |
| Agricultural interest, 50 per }<br>cent. above the average }   | 1788·74                       | 1587    | 1975          | 1750    | 1622·41                     | 1456    | 1580          | 1474    |
| Manufacturing and Agricultural }<br>interests nearly equal }   | 1296·58                       | 1089    | 1502          | 1127    | 1052·10                     | 942     | 954           | 996     |
| Greatest Wealth . . . . .                                      | 1343·44                       | 1191    | 1467          | 1303    | 1183·87                     | 1070    | 836           | 997     |
| Least Wealth . . . . .                                         | 1261·04                       | 1197    | 1405          | 1145    | 1280·63                     | 1137    | 1107          | 991     |
| Total . . . . .                                                | 14343·38                      | 13015   | 17130         | 13959   | 13382·77                    | 12151   | 12380         | 11697   |



An examination of the preceding figures cannot fail to render manifest the powerful influence which even the simple qualification of individuals being able to sign their names, has on the amount of crime in the various districts of the country. Contrasting the totals for the various sections of each group of counties, it will be seen that, in the section of inferior education, the excess of crime is 19·4 per cent., while in the section of higher education there is 7·5 per cent. less crime than the average of the kingdom.

In the next Abstract, the difference per cent. between the actual crime in each of the preceding groups, and the average rate for the whole of England and Wales, is given. When the amount of crime is above the average, the result will be distinguished by the sign +, and that the actual crime is below the average, will be expressed by the sign —.

| GROUP OF COUNTIES.                                                                             | Difference of Crime.             |         |                                |         | Difference per cent.<br>in favour of<br>Education. |         |
|------------------------------------------------------------------------------------------------|----------------------------------|---------|--------------------------------|---------|----------------------------------------------------|---------|
|                                                                                                | Inferior Degree of<br>Education. |         | Higher Degree of<br>Education. |         |                                                    |         |
|                                                                                                | 1842—4.                          | 1845—8. | 1842—4.                        | 1845—8. | 1842—4.                                            | 1845—8. |
| Least Agricultural . . . . .                                                                   | + 28·8                           | + 11·5  | — 12·6                         | — 13·2  | 38·4                                               | 24·7    |
| Greatest ditto . . . . .                                                                       | + 8·4                            | + 9·1   | + 0·9                          | + 7·2   | 7·5                                                | 1·9     |
| Greatest Manufacturing . . . . .                                                               | + 48·4                           | + 8     | + 16·4                         | + 6·2   | 32·0                                               | — 5·4   |
| Least ditto . . . . .                                                                          | + 4·3                            | + 10·9  | — 8·7                          | — 7·5   | 13·0                                               | 18·4    |
| Manufacturing interest, 33½ per cent. above the<br>average . . . . .                           | + 23·2                           | + 10·5  | — 7·2                          | — 5·1   | 30·4                                               | 15·6    |
| Agricultural interest, 50 per cent. above the<br>average . . . . .                             | + 10·4                           | + 10·3  | — 2·6                          | + 1·2   | 13·0                                               | 9·1     |
| Manufacturing and Agricultural interests nearly<br>equal . . . . .                             | + 15·8                           | + 3·5   | — 9·3                          | + 5·7   | 25·1                                               | — 2·2   |
| Greatest Wealth . . . . .                                                                      | + 9·2                            | + 9·4   | — 29·4                         | — 6·8   | 38·6                                               | 16·2    |
| Least Wealth . . . . .                                                                         | + 11·3                           | — 4·4   | — 13·5                         | — 12·8  | 24·8                                               | 8·4     |
| Total average of preceding Groups . . . . .                                                    | + 19·4                           | + 7·2   | — 7·5                          | — 3·7   | 26·9                                               | 10·9    |
| Group in which those signing with “marks” ex-<br>ceed the average by 33½ per cent. . . . .     | + 13·2                           | + 14·6  |                                |         | 43·9                                               | 35·6    |
| Group in which those signing with “marks” are<br>less than the average by 25 per cent. . . . . | ...                              | ...     | — 30·7                         | — 21·0  |                                                    |         |

The last column of the preceding Abstract shews the difference per cent. in the rate of crime in the badly-educated sections of each group, over that which prevails in the better-educated sections of the same group: and it must be regarded as a powerful argument in favour of even the small degree of education or instruction here recognised, that not a single instance has appeared in which a marked, and generally a most striking difference, averaging above 25 per cent., does not shew itself in favour of the better educated districts. All the other combinations and arrangements made to determine the active element in the increase and decrease of crime were unsuccessful, and produced no [satisfactory result;



TABLE XX.  
*Counties in which the actual Crime exceeds the Average Ratio for England and Wales.—Males.*  
 1842-4.

| COUNTIES.                                                                    |                      | Ratio of whole Population engaged in |                   | Proportion of Males signing with Marks the Marriage Registers. | Ratio of Persons of Independent Means. | CRIME.      |         |                         |
|------------------------------------------------------------------------------|----------------------|--------------------------------------|-------------------|----------------------------------------------------------------|----------------------------------------|-------------|---------|-------------------------|
|                                                                              |                      | Agriculture.                         | Manufac-<br>ture. |                                                                |                                        | Calculated. | Actual. | Difference<br>per Cent. |
| Counties in which the excess of crime is under 15 per cent.                  | Berks . . . . .      | 13.2                                 | 10.2              | 41                                                             | 3.0                                    | 236.77      | 251     | 5.9                     |
|                                                                              | Herts . . . . .      | 12.8                                 | 12.8              | 50                                                             | 2.4                                    | 229.57      | 258     | 12.2                    |
|                                                                              | Kent . . . . .       | 8.7                                  | 10.2              | 29                                                             | 3.4                                    | 810.18      | 835     | 3.1                     |
|                                                                              | Lancaster . . . . .  | 3.0                                  | 28.1              | 38                                                             | 2.0                                    | 2574.67     | 2802    | 8.8                     |
|                                                                              | Norfolk . . . . .    | 12.2                                 | 11.8              | 42                                                             | 2.5                                    | 575.46      | 661     | 14.9                    |
|                                                                              | Oxford . . . . .     | 12.9                                 | 10.7              | 35                                                             | 2.4                                    | 236.77      | 265     | 11.8                    |
|                                                                              | Rutland . . . . .    | 15.6                                 | 9.2               | 40                                                             | 2.0                                    | 30.88       | 31      | .4                      |
|                                                                              | Salop . . . . .      | 11.7                                 | 11.9              | 41                                                             | 2.2                                    | 358.25      | 399     | 11.4                    |
|                                                                              | Suffolk . . . . .    | 13.9                                 | 10.0              | 47                                                             | 2.4                                    | 442.67      | 492     | 11.1                    |
|                                                                              | Wilts . . . . .      | 14.1                                 | 10.8              | 43                                                             | 2.3                                    | 376.78      | 424     | 12.5                    |
| Total . . . . .                                                              |                      |                                      |                   |                                                                |                                        | 5872.00     | 6418    | 9.3                     |
| Counties in which the excess of crime is 15 per cent. and under 30 per cent. | Bedford . . . . .    | 13.8                                 | 13.3              | 49                                                             | 1.6                                    | 151.30      | 184     | 21.8                    |
|                                                                              | Bucks . . . . .      | 14.0                                 | 12.6              | 14                                                             | 2.0                                    | 222.36      | 263     | 18.5                    |
|                                                                              | Essex . . . . .      | 14.8                                 | 9.3               | 47                                                             | 2.2                                    | 505.46      | 589     | 16.6                    |
|                                                                              | Hereford . . . . .   | 14.6                                 | 9.9               | 38                                                             | 2.9                                    | 167.80      | 197     | 17.3                    |
|                                                                              | Middlesex . . . . .  | 1.1                                  | 20.0              | 12                                                             | 4.9                                    | 2394.51     | 3076    | 28.4                    |
|                                                                              | Somerset . . . . .   | 10.2                                 | 13.0              | 37                                                             | 3.4                                    | 659.34      | 843     | 27.9                    |
|                                                                              | Stafford . . . . .   | 5.7                                  | 18.7              | 42                                                             | 1.6                                    | 790.62      | 962     | 21.6                    |
|                                                                              | Total . . . . .      |                                      |                   |                                                                |                                        | 4891.39     | 6114    | 25.0                    |
|                                                                              | Chester . . . . .    | 6.7                                  | 23.5              | 38                                                             | 2.1                                    | 590.57      | 792     | 34.2                    |
|                                                                              | Gloucester . . . . . | 7.2                                  | 15.1              | 28                                                             | 3.7                                    | 610.47      | 932     | 52.8                    |
| Counties in which the excess of crime is 30 per cent. and upwards.           | Leicester . . . . .  | 7.9                                  | 19.2              | 32                                                             | 2.0                                    | 311.92      | 431     | 38.1                    |
|                                                                              | Worcester . . . . .  | 10.1                                 | 16.7              | 46                                                             | 2.3                                    | 337.66      | 516     | 52.7                    |
|                                                                              | Warwick . . . . .    | 6.0                                  | 21.9              | 32                                                             | ...                                    | 597.08      | 825     | 38.2                    |
|                                                                              | Total . . . . .      |                                      |                   |                                                                |                                        | 2447.70     | 3496    | 42.8                    |

NOTE.—In England and Wales the average ratio of the whole population :—  
 Engaged in Agriculture . . . . . = 7.9 per cent.  
 ... Manufactures . . . . . = 16.5 ...  
 Signing their names with Marks (Males) . . . . . = 33.0 ...  
 Of Independent Means . . . . . = 2.8 ...



TABLE XX.—(continued.)  
*Counties in which the actual Crime is less than the Average Ratio for England and Wales.—Males.*

1842-4.

| COUNTIES.                                                                                       | Ratio of whole Population engaged in |              | Proportion of Males signing with Marks the Marriage Registers. | Ratio of Persons of Independent Means. | CRIME.      |         |                      |
|-------------------------------------------------------------------------------------------------|--------------------------------------|--------------|----------------------------------------------------------------|----------------------------------------|-------------|---------|----------------------|
|                                                                                                 | Agriculture.                         | Manufacture. |                                                                |                                        | Calculated. | Actual. | Difference per Cent. |
| Counties in which Crime is below the average of England and Wales by not more than 15 per cent. | 13.9                                 | 8.9          | 47                                                             | 2.4                                    | 245.01      | 228     | 6.9                  |
|                                                                                                 | 6.5                                  | 13.1         | 51                                                             | 1.9                                    | 231.62      | 201     | 13.3                 |
|                                                                                                 | 12.9                                 | 13.5         | 38                                                             | 1.9                                    | 295.45      | 261     | 11.5                 |
|                                                                                                 | 8.2                                  | 20.6         | 33                                                             | 1.9                                    | 356.19      | 307     | 13.8                 |
|                                                                                                 | 10.0                                 | 10.6         | 32                                                             | 3.3                                    | 521.93      | 510     | 2.3                  |
|                                                                                                 | 4.4                                  | 16.2         | 17                                                             | 4.2                                    | 844.16      | 728     | 13.7                 |
|                                                                                                 | 11.9                                 | 9.7          | 28                                                             | 3.0                                    | 422.08      | 405     | 4.0                  |
| Total . . . . .                                                                                 |                                      |              |                                                                |                                        | 2916.44     | 2640    | 9.4                  |
| Counties in which the difference is 15 and under 30 per cent.                                   | 10.2                                 | 13.0         | 28                                                             | 3.8                                    | 732.97      | 535     | 27.0                 |
|                                                                                                 | 10.9                                 | 11.1         | 30                                                             | 3.2                                    | 234.72      | 183     | 22.1                 |
|                                                                                                 | 15.9                                 | 9.6          | 32                                                             | 2.5                                    | 542.52      | 433     | 20.1                 |
|                                                                                                 | 13.8 to 4.3                          | 11.6 to 24.6 | 21 to 37                                                       | 1.9 to 4.1                             | 2397.60     | 1818    | 24.2                 |
|                                                                                                 |                                      |              |                                                                |                                        | 3907.81     | 2969    | 24.0                 |
| Counties in which the difference is 30 per cent. and upwards.                                   | 8.8                                  | 14.6         | 16                                                             | 3.7                                    | 255.30      | 81      | 68.2                 |
|                                                                                                 | 7.9                                  | 9.3          | 35                                                             | 2.7                                    | 473.55      | 215     | 54.5                 |
|                                                                                                 | 7.1                                  | 18.9         | 30                                                             | 1.9                                    | 406.63      | 276     | 32.2                 |
|                                                                                                 | 4.4                                  | 13.9         | 26                                                             | 2.5                                    | 492.08      | 248     | 49.6                 |
|                                                                                                 | 14.5                                 | 9.2          | 44                                                             | 2.0                                    | 87.50       | 58      | 33.3                 |
|                                                                                                 | 6.9                                  | 14.9         | 18                                                             | 2.8                                    | 371.63      | 197     | 47.0                 |
|                                                                                                 | 11.6                                 | 13.8         | 20                                                             | 4.0                                    | 84.41       | 27      | 67.8                 |
| Total . . . . .                                                                                 |                                      |              |                                                                |                                        | 2171.10     | 1102    | 49.2                 |
| WALES . . . . .                                                                                 | 10.3 to 12.7                         | 9.0 to 10.5  | 46 to 48                                                       | 2.6                                    | 1323.87     | 550     | 58.4                 |



TABLE XXI.

*Counties in which the Actual Crime exceeds the Average Ratio for England and Wales.—Males.*

1845-8.

| COUNTIES.                                                                    | Ratio of whole Population engaged in |              | Proportion of Males signing with Marks the Marriage Registers. | Ratio of Persons of Independent Means. | CRIME.      |         |                      |
|------------------------------------------------------------------------------|--------------------------------------|--------------|----------------------------------------------------------------|----------------------------------------|-------------|---------|----------------------|
|                                                                              | Manufacture.                         | Agriculture. |                                                                |                                        | Calculated. | Actual. | Difference per Cent. |
| Counties in which the excess of Crime is under 15 per cent.                  | 10.9                                 | 11.1         | 30                                                             | 3.2                                    | 206         | 210     | 1.9                  |
|                                                                              | 7.9                                  | 19.2         | 32                                                             | 2.0                                    | 274         | 295     | 7.6                  |
|                                                                              | 15.6                                 | 9.2          | 40                                                             | 2.0                                    | 27          | 31      | 14.8                 |
|                                                                              | 13.9                                 | 10.0         | 47                                                             | 2.4                                    | 382         | 393     | 2.9                  |
|                                                                              | 4.4                                  | 16.2         | 17                                                             | 4.2                                    | 793         | 864     | 8.9                  |
|                                                                              | 11.9                                 | 9.7          | 28                                                             | 3.0                                    | 377         | 395     | 4.8                  |
|                                                                              | 14.1                                 | 10.8         | 43                                                             | 2.3                                    | 330         | 378     | 14.5                 |
| Total . . . .                                                                |                                      |              |                                                                |                                        | 2389        | 2566    | 7.4                  |
| Counties in which the excess of Crime is 15 per cent. and under 30 per cent. | 13.8                                 | 13.3         | 49                                                             | 1.6                                    | 134         | 159     | 18.6                 |
|                                                                              | 13.2                                 | 10.2         | 41                                                             | 3.0                                    | 211         | 256     | 21.3                 |
|                                                                              | 6.7                                  | 23.5         | 38                                                             | 2.1                                    | 558         | 657     | 17.7                 |
|                                                                              | 14.8                                 | 9.3          | 47                                                             | 2.2                                    | 444         | 529     | 19.1                 |
|                                                                              | 14.6                                 | 9.9          | 38                                                             | 2.9                                    | 145         | 171     | 17.9                 |
|                                                                              | 12.8                                 | 12.8         | 50                                                             | 2.4                                    | 200         | 246     | 23.0                 |
|                                                                              | 12.2                                 | 11.8         | 42                                                             | 2.5                                    | 499         | 583     | 16.8                 |
|                                                                              | 12.9                                 | 10.7         | 35                                                             | 2.4                                    | 205         | 240     | 17.1                 |
|                                                                              | 10.2                                 | 13.0         | 37                                                             | 3.4                                    | 546         | 639     | 17.0                 |
|                                                                              | 10.0                                 | 10.6         | 32                                                             | 3.3                                    | 473         | 550     | 16.3                 |
|                                                                              |                                      |              |                                                                |                                        | 3415        | 4030    | 18.0                 |
| Total . . . .                                                                |                                      |              |                                                                |                                        |             |         |                      |
| Counties in which the excess of Crime is 30 per cent. and upwards.           | 14.0                                 | 12.6         | 14                                                             | 2.0                                    | 192         | 289     | 50.5                 |
|                                                                              | 7.2                                  | 15.1         | 28                                                             | 3.7                                    | 548         | 783     | 42.9                 |
|                                                                              | 1.1                                  | 20.0         | 12                                                             | 4.9                                    | 2218        | 3558    | 60.4                 |
|                                                                              | 6.0                                  | 21.9         | 32                                                             | ...                                    | 560         | 778     | 38.9                 |
|                                                                              | 10.1                                 | 16.7         | 46                                                             | 2.3                                    | 300         | 471     | 57.0                 |
|                                                                              |                                      |              |                                                                |                                        | 3818        | 5879    | 54.0                 |
| Total . . . .                                                                |                                      |              |                                                                |                                        |             |         |                      |



TABLE XXI.—(continued.)

*Counties in which the Actual Crime is less than the Average Ratio for England and Wales.—Males.*

1845-8.

| COUNTIES.                                                                                       | Ratio of the whole Population engaged in |              | Proportion of Males signing with Marks the Marriage Registers. | Ratio of Persons of Independent Means. | CRIME.      |         |                      |
|-------------------------------------------------------------------------------------------------|------------------------------------------|--------------|----------------------------------------------------------------|----------------------------------------|-------------|---------|----------------------|
|                                                                                                 | Agriculture.                             | Manufacture. |                                                                |                                        | Calculated. | Actual. | Difference per Cent. |
| Counties in which crime is below the average of England and Wales by not more than 15 per cent. | 13.9                                     | 8.9          | 47                                                             | 2.4                                    | 222         | 217     | 2.2                  |
|                                                                                                 | 8.8                                      | 14.6         | 16                                                             | 3.7                                    | 222         | 90      | 14.4                 |
|                                                                                                 | 14.5                                     | 9.2          | 44                                                             | 2.0                                    | 75          | 74      | 1.3                  |
|                                                                                                 | 8.7                                      | 10.2         | 29                                                             | 3.4                                    | 741         | 710     | 4.2                  |
|                                                                                                 | 3.0                                      | 28.1         | 38                                                             | 2.0                                    | 2511        | 2423    | 3.5                  |
|                                                                                                 | 12.9                                     | 13.5         | 38                                                             | 1.9                                    | 263         | 236     | 10.3                 |
|                                                                                                 | 5.7                                      | 18.7         | 42                                                             | 1.6                                    | 754         | 719     | 4.7                  |
| Total . . . . .                                                                                 |                                          |              |                                                                |                                        | 4788        | 4469    | 6.7                  |
| Counties in which the difference is 15 and under 30 per cent.                                   | 10.2                                     | 13.0         | 28                                                             | 3.8                                    | 643         | 520     | 19.1                 |
|                                                                                                 | 15.9                                     | 9.6          | 32                                                             | 2.5                                    | 485         | 365     | 24.7                 |
|                                                                                                 | 6.5                                      | 13.1         | 51                                                             | 1.9                                    | 234         | 193     | 17.5                 |
|                                                                                                 | 8.2                                      | 20.6         | 33                                                             | 1.9                                    | 318         | 267     | 16.0                 |
|                                                                                                 | 11.6                                     | 13.8         | 20                                                             | 4.0                                    | 55          | 43      | 21.8                 |
|                                                                                                 |                                          |              |                                                                |                                        | 1735        | 1388    | 20.0                 |
| Counties in which the difference is 30 per cent. and upwards.                                   | 7.9                                      | 9.3          | 35                                                             | 2.7                                    | 419         | 222     | 47.0                 |
|                                                                                                 | 7.1                                      | 18.9         | 30                                                             | 1.9                                    | 364         | 199     | 45.3                 |
|                                                                                                 | 4.4                                      | 13.9         | 26                                                             | 2.5                                    | 479         | 203     | 57.6                 |
|                                                                                                 | 6.9                                      | 14.9         | 18                                                             | 2.8                                    | 336         | 139     | 58.6                 |
|                                                                                                 | 11.7                                     | 11.9         | 41                                                             | 2.2                                    | 311         | 214     | 31.2                 |
|                                                                                                 | 13.8 to 4.3                              | 11.6 to 24.6 | 21 to 37                                                       | 1.9 to 4.1                             | 2252        | 1363    | 39.5                 |
|                                                                                                 |                                          |              |                                                                |                                        | 4161        | 2340    | 43.8                 |
| Total . . . . .                                                                                 |                                          |              |                                                                |                                        |             |         |                      |



TABLE XXII.

*Criminal Offenders in England and Wales in 1845, 1846, 1847, and 1848, with the Ratio of Crime to the Population at the various terms of Life, calculated to the corrected Population at the respective periods.—Males.*

| AGE.                    |      | Population. |            | Criminals. |       | Ratio of Criminals<br>to Total Population<br>per cent. |
|-------------------------|------|-------------|------------|------------|-------|--------------------------------------------------------|
| Under 5 . . .           | 1845 | 1,099,110   | 4,475,992  |            |       |                                                        |
|                         | 1846 | 1,112,263   |            |            |       |                                                        |
|                         | 1847 | 1,125,574   |            |            |       |                                                        |
|                         | 1848 | 1,139,045   |            |            |       |                                                        |
| 5 to 10 . . .           | 1845 | 992,027     | 4,028,464  |            |       |                                                        |
|                         | 1846 | 1,002,019   |            |            |       |                                                        |
|                         | 1847 | 1,012,112   |            |            |       |                                                        |
|                         | 1848 | 1,022,306   |            |            |       |                                                        |
| 10 ... 15 . . .         | 1845 | 914,109     | 3,708,426  |            |       |                                                        |
|                         | 1846 | 922,719     |            |            |       |                                                        |
|                         | 1847 | 931,412     |            |            |       |                                                        |
|                         | 1848 | 940,186     |            |            |       |                                                        |
| Under 15 . . .          | 1845 | 3,005,246   | 12,212,882 | 1361       | 5275  | ·0432                                                  |
|                         | 1846 | 3,037,001   |            | 1451       |       |                                                        |
|                         | 1847 | 3,069,098   |            | 1538       |       |                                                        |
|                         | 1848 | 3,101,537   |            | 925        |       |                                                        |
| 15 to 20 . . .          | 1845 | 822,186     | 3,351,880  | 4785       | 21466 | ·6404                                                  |
|                         | 1846 | 832,620     |            | 4980       |       |                                                        |
|                         | 1847 | 843,187     |            | 5700       |       |                                                        |
|                         | 1848 | 853,887     |            | 6001       |       |                                                        |
| 20 ... 25 . . .         | 1845 | 780,262     | 3,172,242  | 4804       | 21263 | ·6702                                                  |
|                         | 1846 | 788,732     |            | 4757       |       |                                                        |
|                         | 1847 | 797,296     |            | 5362       |       |                                                        |
|                         | 1848 | 805,952     |            | 6340       |       |                                                        |
| 25 ... 30 . . .         | 1845 | 613,063     | 2,492,485  | 2771       | 12813 | ·5141                                                  |
|                         | 1846 | 619,721     |            | 2860       |       |                                                        |
|                         | 1847 | 626,450     |            | 3356       |       |                                                        |
|                         | 1848 | 633,251     |            | 3826       |       |                                                        |
| 30 ... 40 . . .         | 1845 | 1,063,952   | 4,356,056  | 3092       | 14113 | ·3240                                                  |
|                         | 1846 | 1,080,488   |            | 3100       |       |                                                        |
|                         | 1847 | 1,097,281   |            | 3788       |       |                                                        |
|                         | 1848 | 1,114,335   |            | 4133       |       |                                                        |
| 40 ... 50 . . .         | 1845 | 796,361     | 3,259,578  | 1528       | 7243  | ·2222                                                  |
|                         | 1846 | 808,591     |            | 1661       |       |                                                        |
|                         | 1847 | 821,009     |            | 1929       |       |                                                        |
|                         | 1848 | 833,617     |            | 2125       |       |                                                        |
| 50 ... 60 . . .         | 1845 | 537,321     | 2,213,817  | 662        | 2954  | ·1334                                                  |
|                         | 1846 | 547,936     |            | 664        |       |                                                        |
|                         | 1847 | 558,761     |            | 802        |       |                                                        |
|                         | 1848 | 569,799     |            | 826        |       |                                                        |
| 60 and upwards          | 1845 | 555,807     | 2,257,327  | 338        | 1553  | ·0688                                                  |
|                         | 1846 | 561,452     |            | 377        |       |                                                        |
|                         | 1847 | 567,154     |            | 428        |       |                                                        |
|                         | 1848 | 572,914     |            | 410        |       |                                                        |
| Proportion ;—1 in 384 . |      |             | 33,316,267 |            | 86680 | ·2602                                                  |



TABLE XXIII.

*Criminal Offenders in England and Wales in 1845, 1846, 1847, and 1848, with the Ratio of Crime to the Population at the various terms of Life, calculated to the corrected Population for the respective Periods.—Females.*

| AGE.                   |      | Population. |            | Criminals. |        | Ratio of Criminals<br>to Total Population<br>per cent. |
|------------------------|------|-------------|------------|------------|--------|--------------------------------------------------------|
| Under 5 . .            | 1845 | 1,103,645   | 4,484,492  |            |        |                                                        |
|                        | 1846 | 1,115,216   |            |            |        |                                                        |
|                        | 1847 | 1,126,908   |            |            |        |                                                        |
|                        | 1848 | 1,138,723   |            |            |        |                                                        |
| 5 to 10 . .            | 1845 | 988,471     | 4,009,745  |            |        |                                                        |
|                        | 1846 | 997,724     |            |            |        |                                                        |
|                        | 1847 | 1,007,062   |            |            |        |                                                        |
|                        | 1848 | 1,016,488   |            |            |        |                                                        |
| 10 ... 15 . .          | 1845 | 891,021     | 3,624,241  |            |        |                                                        |
|                        | 1846 | 900,944     |            |            |        |                                                        |
|                        | 1847 | 911,150     |            |            |        |                                                        |
|                        | 1848 | 921,126     |            |            |        |                                                        |
| Under 15 . .           | 1845 | 2,983,137   | 12,118,478 | 220        | 871    | ·0072                                                  |
|                        | 1846 | 3,013,884   |            | 217        |        |                                                        |
|                        | 1847 | 3,045,120   |            | 256        |        |                                                        |
|                        | 1848 | 3,076,337   |            | 178        |        |                                                        |
| 15 to 20 . .           | 1845 | 844,078     | 3,435,843  | 1179       | 5146   | ·1498                                                  |
|                        | 1846 | 853,923     |            | 1259       |        |                                                        |
|                        | 1847 | 863,883     |            | 1370       |        |                                                        |
|                        | 1848 | 873,959     |            | 1338       |        |                                                        |
| 20 ... 25 . .          | 1845 | 848,830     | 3,427,411  | 1193       | 5161   | ·1506                                                  |
|                        | 1846 | 854,156     |            | 1197       |        |                                                        |
|                        | 1847 | 859,515     |            | 1360       |        |                                                        |
|                        | 1848 | 864,910     |            | 1411       |        |                                                        |
| 25 ... 30 . .          | 1845 | 689,803     | 2,785,294  | 768        | 3454   | ·1240                                                  |
|                        | 1846 | 694,132     |            | 856        |        |                                                        |
|                        | 1847 | 698,488     |            | 915        |        |                                                        |
|                        | 1848 | 702,871     |            | 915        |        |                                                        |
| 30 ... 40 . .          | 1845 | 1,122,776   | 4,601,686  | 788        | 3873   | ·0842                                                  |
|                        | 1846 | 1,141,008   |            | 938        |        |                                                        |
|                        | 1847 | 1,159,537   |            | 1106       |        |                                                        |
|                        | 1848 | 1,178,365   |            | 1041       |        |                                                        |
| 40 ... 50 . .          | 1845 | 833,126     | 3,419,310  | 497        | 2084   | ·0609                                                  |
|                        | 1846 | 847,429     |            | 494        |        |                                                        |
|                        | 1847 | 861,978     |            | 570        |        |                                                        |
|                        | 1848 | 876,777     |            | 523        |        |                                                        |
| 50 ... 60 . .          | 1845 | 575,100     | 2,372,977  | 228        | 913    | ·0385                                                  |
|                        | 1846 | 587,030     |            | 210        |        |                                                        |
|                        | 1847 | 599,208     |            | 246        |        |                                                        |
|                        | 1848 | 611,639     |            | 229        |        |                                                        |
| 60 and upwards         | 1845 | 642,365     | 2,615,512  | 89         | 410    | ·0157                                                  |
|                        | 1846 | 649,980     |            | 86         |        |                                                        |
|                        | 1847 | 657,685     |            | 107        |        |                                                        |
|                        | 1848 | 665,482     |            | 128        |        |                                                        |
| Proportion ;—1 in 1587 |      |             | 34,776,511 |            | 21,912 | ·0630                                                  |



satisfactory result; in fact, they did not lead to the discovery of any condition or circumstance of life which was peculiar to one district more than another; but, as soon as the educational test is introduced, it immediately analyzes groups and districts into a uniform and regular series, which before shewed the most contradictory results. If a few exceptions appeared, they might suggest the propriety of a still further refinement in the analysis; but the regularity is so remarkable, that it immediately becomes evident that at least one very powerful element in the question has been determined, and one on which legislative and preventive measures may easily be founded, for the reduction of crime and the elevation of the moral condition of the people.

On a careful consideration of the evidence and facts brought forward, it will be seen that, although the peculiarities in the mining, manufacturing, agricultural, and other conditions of the population are not sufficient to account for the great differences in the degree of crime prevailing in various districts, still it is clear, that the results arising out of those peculiar conditions are such as to shew that they exercise a secondary influence on the question of crime, and therefore ought not to be overlooked in any complete investigation.

The preceding Table, XX, was formed in order to shew, that in those districts in which there was an equal difference in the amount of crime from the average of the country, no peculiar element could be traced which was common to all the counties composing each group.

In connection with the results, adduced in the preceding part of this paper, it will be important to view the amount of education among criminals themselves.

*Degree of Education amongst Male Criminals in England and Wales during the four years 1836-9, the three years 1842-4, and the four years 1845-8.*

| Degree of Instruction.                                      | Four Years,<br>1836-9. | Three Years,<br>1842-4. | Four Years,<br>1845-8. | Eleven Years,<br>1836-9, 1842-8. |
|-------------------------------------------------------------|------------------------|-------------------------|------------------------|----------------------------------|
| Number who could neither read nor write . . . . .           | 25111                  | 21779                   | 25896                  | 72786                            |
| Number who could read and write imperfectly . . . . .       | 39646                  | 41620                   | 50560                  | 131826                           |
| Number who could read and write well . . . . .              | 8325                   | 5909                    | 8252                   | 22486                            |
| Number of superior Education . . . . .                      | 422                    | 308                     | 324                    | 1054                             |
| Total . . . . .                                             | 73504                  | 69616                   | 85032                  | 228152                           |
| Number whose Instruction could not be ascertained . . . . . | 1887                   | 1924                    | 1648                   | 5459                             |
| Grand Total . . . . .                                       | 75391                  | 71540                   | 86680                  | 233611                           |



| Degree of Instruction.                                  | Four Years,<br>1836-9. | Three Years,<br>1842-4. | Four Years,<br>1845-8. | Eleven Years,<br>1836-9, 1842-8. |
|---------------------------------------------------------|------------------------|-------------------------|------------------------|----------------------------------|
| Ratio of Criminals who could neither read nor write . . | 34.2                   | 31.3                    | 30.4                   | 31.9                             |
| ... .. who could read and write imperfectly             | 53.9                   | 59.8                    | 59.5                   | 57.8                             |
| ... .. who could read and write well . .                | 11.3                   | 8.5                     | 9.7                    | 9.8                              |
| ... .. who possessed superior education .               | 0.6                    | 0.4                     | 0.4                    | 0.5                              |

It is thus curious to observe, that while the proportion of criminals who could neither read nor write was 31.9 per cent., the ratio of persons who signed their marriage register with marks, (that is, were unable to write their names) was 32 per cent.; and it might thence be inferred that, from the small difference in those two ratios, education could have no very important effect in repressing or augmenting the number of criminals; but the number of persons signing their marriage registers with marks should not be taken as the absolute, but only as the relative degree of education in different districts; and it should be borne in mind, that although 32.0 is the average for the whole of England and Wales for the years 1836-48, there are some districts in which the proportion is as low as 12 and 14 per cent., and others in which the ratio is as high as 50 and 51 per cent.; and it has also been already shewn, that no reliance can be placed on the mere gross average results thus given, but that it is imperatively necessary to separate the whole into groups, in which the influences of wealth, manufactures, and agriculture are common—in fact, into groups differing in respect of education only, so as to furnish a proper argument for or against the influence which education may have on the amount of crime.

According to the returns of the Registrar General, the proportion of males signing their marriage registers with marks has gradually decreased from 33.7 per cent. in 1839, to 31.2 per cent. in 1848. It also appears that during the same years the number of criminals unable to read or write has decreased from 33.5 per cent. in the former year to 31.9 per cent. in the latter; from the year 1839 the ratio had gradually fallen to 29.8 per cent. in 1844, and had again pretty uniformly increased to 31.9 per cent. in the year 1848; but it does not follow on this account that education is favourable to crime, for it may happen that increased temptations over the country generally have arisen within that period; and the question would still remain open, whether in the higher educated districts crime was greater or less than in the lower educated districts, all the other conditions of those districts being the same.

Adopting the test furnished by the records of the Registrar General, it is obvious that in those counties in which there is an inferior degree of education, there is also an increased ratio of crime; and that not a small and barely appreciable difference, but in 11 different groups of counties into which the whole of England and Wales is divided, shewing a difference in favour of the best educated districts varying from 13 to 43.9 per cent., and averaging 25 per cent. for the whole of England and Wales. It is thus evident, that so far as the test now furnished is available, more conclusive evidence could not be called for.

[This test, however,



TABLE XXIV.

*Shewing the Degree of Instruction among the Criminals in those Counties where Crime exceeds the Average Ratio of England and Wales.—Males.  
1842-3-4.*

| COUNTIES.             | Neither Read nor Write. |                      | Read and Write imperfectly. |                      | Read and Write well. |                      | Superior Education. |                      | Instruction could not be ascertained. |                      | Total. |
|-----------------------|-------------------------|----------------------|-----------------------------|----------------------|----------------------|----------------------|---------------------|----------------------|---------------------------------------|----------------------|--------|
|                       | Actual Number.          | Proportion per Cent. | Actual Number.              | Proportion per Cent. | Actual Number.       | Proportion per Cent. | Actual Number.      | Proportion per Cent. | Actual Number.                        | Proportion per Cent. |        |
| Berks . . . . .       | 210                     | ...                  | 531                         | ...                  | 30                   | ...                  | 1                   | ...                  | 34                                    | ...                  | 806    |
| Herts . . . . .       | 304                     | ...                  | 436                         | ...                  | 30                   | ...                  | 3                   | ...                  | 16                                    | ...                  | 789    |
| Kent . . . . .        | 827                     | ...                  | 1550                        | ...                  | 113                  | ...                  | 7                   | ...                  | 60                                    | ...                  | 2557   |
| Lancaster . . . . .   | 3220                    | ...                  | 4624                        | ...                  | 518                  | ...                  | 36                  | ...                  | 186                                   | ...                  | 8584   |
| Norfolk . . . . .     | 756                     | ...                  | 1015                        | ...                  | 202                  | ...                  | 6                   | ...                  | 28                                    | ...                  | 2007   |
| Oxford . . . . .      | 258                     | ...                  | 516                         | ...                  | 23                   | ...                  | ...                 | ...                  | 24                                    | ...                  | 821    |
| Rutland . . . . .     | 28                      | ...                  | 52                          | ...                  | 13                   | ...                  | ...                 | ...                  | 3                                     | ...                  | 96     |
| Salop . . . . .       | 456                     | ...                  | 693                         | ...                  | 28                   | ...                  | 3                   | ...                  | 25                                    | ...                  | 1205   |
| Suffolk . . . . .     | 517                     | ...                  | 815                         | ...                  | 134                  | ...                  | 4                   | ...                  | 32                                    | ...                  | 1502   |
| Wilts . . . . .       | 299                     | ...                  | 839                         | ...                  | 96                   | ...                  | 15                  | ...                  | 14                                    | ...                  | 1263   |
| Total . . . . .       | 6875                    | 35.8                 | 11071                       | 57.6                 | 1187                 | 6.2                  | 75                  | .4                   | 422                                   | 2.1                  | 19630  |
| Beds . . . . .        | 248                     | ...                  | 295                         | ...                  | 5                    | ...                  | ...                 | ...                  | 3                                     | ...                  | 551    |
| Bucks . . . . .       | 304                     | ...                  | 436                         | ...                  | 42                   | ...                  | 5                   | ...                  | 12                                    | ...                  | 799    |
| Essex . . . . .       | 741                     | ...                  | 962                         | ...                  | 56                   | ...                  | 8                   | ...                  | 24                                    | ...                  | 1791   |
| Hereford . . . . .    | 243                     | ...                  | 340                         | ...                  | 9                    | ...                  | ...                 | ...                  | 3                                     | ...                  | 595    |
| Middlesex . . . . .   | 1976                    | ...                  | 5405                        | ...                  | 1670                 | ...                  | 29                  | ...                  | 384                                   | ...                  | 9464   |
| Somerset . . . . .    | 933                     | ...                  | 1371                        | ...                  | 222                  | ...                  | 2                   | ...                  | 164                                   | ...                  | 2692   |
| Stafford . . . . .    | 887                     | ...                  | 1608                        | ...                  | 360                  | ...                  | 27                  | ...                  | 101                                   | ...                  | 2983   |
| Total . . . . .       | 5332                    | 29.3                 | 10417                       | 57.3                 | 2364                 | 13.0                 | 71                  | .4                   | 691                                   | 3.7                  | 18875  |
| Chester . . . . .     | 732                     | ...                  | 1519                        | ...                  | 99                   | ...                  | 26                  | ...                  | 17                                    | ...                  | 2393   |
| Gloucester . . . . .  | 801                     | ...                  | 1853                        | ...                  | 136                  | ...                  | 6                   | ...                  | 70                                    | ...                  | 2866   |
| Leicester . . . . .   | 361                     | ...                  | 769                         | ...                  | 159                  | ...                  | 1                   | ...                  | 12                                    | ...                  | 1302   |
| Worcester . . . . .   | 564                     | ...                  | 925                         | ...                  | 55                   | ...                  | 9                   | ...                  | 45                                    | ...                  | 1598   |
| Warwick . . . . .     | 853                     | ...                  | 1315                        | ...                  | 275                  | ...                  | 29                  | ...                  | 17                                    | ...                  | 2489   |
| Total . . . . .       | 3311                    | 31.6                 | 6381                        | 60.8                 | 724                  | 6.9                  | 71                  | .7                   | 161                                   | 1.5                  | 10648  |
| Grand Total . . . . . | 15518                   | 32.4                 | 27869                       | 58.2                 | 4275                 | 8.9                  | 217                 | .5                   | 1274                                  | 2.6                  | 49153  |







TABLE XXV.

*Instruction among the Criminals in those Counties where Crime is below the Average Ratio of England and Wales.—Males.*

1845-6-7-8.

| COUNTIES.                                                                                       | Neither Read nor Write. |                      | Read and Write imperfectly. |                      | Read and Write well. |                      | Superior Education. |                      | Instruction could not be ascertained. |                      | Total. |
|-------------------------------------------------------------------------------------------------|-------------------------|----------------------|-----------------------------|----------------------|----------------------|----------------------|---------------------|----------------------|---------------------------------------|----------------------|--------|
|                                                                                                 | Actual Number.          | Proportion per Cent. | Actual Number.              | Proportion per Cent. | Actual Number.       | Proportion per Cent. | Actual Number.      | Proportion per Cent. | Actual Number.                        | Proportion per Cent. |        |
| Counties in which Crime is below the average of England and Wales by not more than 15 per cent. | 265                     | ...                  | 535                         | ...                  | 64                   | ...                  | 3                   | ...                  | 17                                    | ...                  | 884    |
| Cambridge                                                                                       | 195                     | ...                  | 509                         | ...                  | 66                   | ...                  | 1                   | ...                  | 4                                     | ...                  | 775    |
| Monmouth                                                                                        | 301                     | ...                  | 598                         | ...                  | 46                   | ...                  | 2                   | ...                  | 17                                    | ...                  | 964    |
| Northampton                                                                                     | 327                     | ...                  | 662                         | ...                  | 79                   | ...                  | 3                   | ...                  | 5                                     | ...                  | 1076   |
| Notts                                                                                           | 655                     | ...                  | 1414                        | ...                  | 115                  | ...                  | 16                  | ...                  | 31                                    | ...                  | 2231   |
| Southern                                                                                        | 849                     | ...                  | 2140                        | ...                  | 459                  | ...                  | 9                   | ...                  | 45                                    | ...                  | 3502   |
| Surrey                                                                                          | 454                     | ...                  | 1047                        | ...                  | 74                   | ...                  | 1                   | ...                  | 15                                    | ...                  | 1591   |
| Sussex                                                                                          | 3046                    | 27.97                | 6905                        | 63.42                | 903                  | 82.9                 | 35                  | 0.32                 | 134                                   | 1.21                 | 11023  |
| Total                                                                                           |                         |                      |                             |                      |                      |                      |                     |                      |                                       |                      |        |
| Counties in which the difference is 15 and under 30 per cent.                                   | 812                     | ...                  | 1375                        | ...                  | 271                  | ...                  | 9                   | ...                  | 47                                    | ...                  | 2514   |
| Devon                                                                                           | 273                     | ...                  | 467                         | ...                  | 94                   | ...                  | 7                   | ...                  | 24                                    | ...                  | 865    |
| Dorset                                                                                          | 432                     | ...                  | 915                         | ...                  | 107                  | ...                  | 6                   | ...                  | 16                                    | ...                  | 1476   |
| Lincoln                                                                                         | 1463                    | ...                  | 3639                        | ...                  | 320                  | ...                  | 18                  | ...                  | 88                                    | ...                  | 5528   |
| York                                                                                            | 2980                    | 29.20                | 6396                        | 62.66                | 792                  | 7.75                 | 40                  | 0.39                 | 175                                   | 1.68                 | 10383  |
| Total                                                                                           |                         |                      |                             |                      |                      |                      |                     |                      |                                       |                      |        |
| Counties in which the difference is 30 per cent. and upwards.                                   | 85                      | ...                  | 234                         | ...                  | 42                   | ...                  | ...                 | ...                  | 10                                    | ...                  | 371    |
| Cumberland                                                                                      | 293                     | ...                  | 538                         | ...                  | 48                   | ...                  | 7                   | ...                  | 4                                     | ...                  | 890    |
| Cornwall                                                                                        | 196                     | ...                  | 570                         | ...                  | 22                   | ...                  | 2                   | ...                  | 27                                    | ...                  | 817    |
| Derby                                                                                           | 272                     | ...                  | 510                         | ...                  | 30                   | ...                  | ...                 | ...                  | 25                                    | ...                  | 837    |
| Durham                                                                                          | 87                      | ...                  | 198                         | ...                  | 10                   | ...                  | ...                 | ...                  | 4                                     | ...                  | 299    |
| Hunts                                                                                           | 130                     | ...                  | 398                         | ...                  | 22                   | ...                  | 4                   | ...                  | 11                                    | ...                  | 565    |
| Northumberland                                                                                  | 37                      | ...                  | 126                         | ...                  | 5                    | ...                  | 2                   | ...                  | 5                                     | ...                  | 175    |
| Westmoreland                                                                                    | 1100                    | 28.44                | 2574                        | 66.54                | 179                  | 4.63                 | 15                  | 0.39                 | 86                                    | 2.17                 | 3954   |
| Total                                                                                           |                         |                      |                             |                      |                      |                      |                     |                      |                                       |                      |        |
| Grand Total                                                                                     | 7126                    | 28.54                | 15875                       | 63.59                | 1874                 | 7.51                 | 90                  | 0.36                 | 395                                   | 1.56                 | 25360  |
| England                                                                                         | 25135                   | 30.33                | 49369                       | 59.57                | 8056                 | 9.72                 | 314                 | 0.38                 | 1517                                  | 1.79                 | 84391  |
| Wales                                                                                           | 761                     | 35.27                | 1191                        | 55.19                | 196                  | 9.08                 | 10                  | 0.46                 | 131                                   | 5.72                 | 2289   |
| England and Wales                                                                               | 25896                   | 30.45                | 50560                       | 59.46                | 8252                 | 9.71                 | 324                 | 0.38                 | 1648                                  | 1.94                 | 86680  |



TABLE XXV.—MALES.—(*continued.*)

| COUNTIES.                                                          | Neither Read nor Write. |                      | Read and Write imperfectly. |                      | Read and Write well. |                      | Superior Education. |                      | Instruction could not be ascertained. |                      | Total. |
|--------------------------------------------------------------------|-------------------------|----------------------|-----------------------------|----------------------|----------------------|----------------------|---------------------|----------------------|---------------------------------------|----------------------|--------|
|                                                                    | Actual Number.          | Proportion per Cent. | Actual Number.              | Proportion per Cent. | Actual Number.       | Proportion per Cent. | Actual Number.      | Proportion per Cent. | Actual Number.                        | Proportion per Cent. |        |
| Counties in which the excess of crime is under 15 per cent.        | Berks . . . . .         | 349                  | ...                         | 639                  | ...                  | 33                   | ...                 | 2                    | 5                                     | ...                  | 1028   |
|                                                                    | Herts . . . . .         | 403                  | ...                         | 460                  | ...                  | 112                  | ...                 | 6                    | 36                                    | ...                  | 1017   |
|                                                                    | Kent . . . . .          | 1031                 | ...                         | 1613                 | ...                  | 173                  | ...                 | 13                   | 60                                    | ...                  | 2890   |
|                                                                    | Lancaster . . . . .     | 3192                 | ...                         | 5837                 | ...                  | 613                  | ...                 | 47                   | 161                                   | ...                  | 9850   |
|                                                                    | Norfolk . . . . .       | 921                  | ...                         | 1096                 | ...                  | 306                  | ...                 | 1                    | 36                                    | ...                  | 2360   |
|                                                                    | Oxford . . . . .        | 280                  | ...                         | 634                  | ...                  | 43                   | ...                 | 2                    | 10                                    | ...                  | 969    |
|                                                                    | Rutland . . . . .       | 45                   | ...                         | 64                   | ...                  | 13                   | ...                 | ...                  | 1                                     | ...                  | 123    |
|                                                                    | Salop . . . . .         | 331                  | ...                         | 508                  | ...                  | 12                   | ...                 | ...                  | 8                                     | ...                  | 859    |
|                                                                    | Suffolk . . . . .       | 528                  | ...                         | 906                  | ...                  | 124                  | ...                 | 9                    | 29                                    | ...                  | 1596   |
|                                                                    | Wilts . . . . .         | 351                  | ...                         | 1020                 | ...                  | 133                  | ...                 | 5                    | 16                                    | ...                  | 1525   |
|                                                                    | Total . . . . .         | 7431                 | 34.00                       | 12777                | 58.46                | 1562                 | 7.15                | 85                   | 362                                   | 1.63                 | 22217  |
| Counties in which the excess of crime is 15 and under 30 per cent. | Bedford . . . . .       | 252                  | ...                         | 343                  | ...                  | 41                   | ...                 | ...                  | 8                                     | ...                  | 644    |
|                                                                    | Bucks. . . . .          | 354                  | ...                         | 666                  | ...                  | 51                   | ...                 | 5                    | 29                                    | ...                  | 1105   |
|                                                                    | Essex . . . . .         | 830                  | ...                         | 1169                 | ...                  | 102                  | ...                 | 14                   | 29                                    | ...                  | 2144   |
|                                                                    | Hereford . . . . .      | 315                  | ...                         | 361                  | ...                  | 9                    | ...                 | ...                  | 4                                     | ...                  | 689    |
|                                                                    | Middlesex . . . . .     | 3350                 | ...                         | 8488                 | ...                  | 2334                 | ...                 | 17                   | 304                                   | ...                  | 14493  |
|                                                                    | Somerset . . . . .      | 908                  | ...                         | 1287                 | ...                  | 356                  | ...                 | 1                    | 105                                   | ...                  | 2657   |
|                                                                    | Stafford . . . . .      | 902                  | ...                         | 1618                 | ...                  | 319                  | ...                 | 22                   | 109                                   | ...                  | 2970   |
|                                                                    | Total . . . . .         | 6911                 | 28.66                       | 13932                | 57.78                | 3212                 | 13.32               | 59                   | 588                                   | 2.38                 | 24702  |
|                                                                    | Chester . . . . .       | 895                  | ...                         | 1536                 | ...                  | 177                  | ...                 | 20                   | 40                                    | ...                  | 2668   |
|                                                                    | Gloucester . . . . .    | 836                  | ...                         | 1686                 | ...                  | 590                  | ...                 | 22                   | 53                                    | ...                  | 3187   |
|                                                                    | Leicester . . . . .     | 279                  | ...                         | 700                  | ...                  | 201                  | ...                 | ...                  | 10                                    | ...                  | 1190   |
| Counties in which the excess of crime is 30 per cent. and upwards. | Worcester . . . . .     | 666                  | ...                         | 1162                 | ...                  | 52                   | ...                 | 8                    | 41                                    | ...                  | 1929   |
|                                                                    | Warwick . . . . .       | 991                  | ...                         | 1701                 | ...                  | 388                  | ...                 | 30                   | 28                                    | ...                  | 3138   |
|                                                                    | Total . . . . .         | 3667                 | 30.71                       | 6785                 | 56.83                | 1408                 | 11.79               | 80                   | 172                                   | 1.42                 | 12112  |
|                                                                    | Grand Total . . . . .   | 18009                | 31.10                       | 33494                | 57.84                | 6182                 | 10.67               | 224                  | 1122                                  | 1.90                 | 59031  |



This test, however, being derived from a source partly independent of the criminals themselves, has led to a similar analysis of an educational test to be derived from among the criminal population. The Home Office returns shew for each year the number of criminals *who can neither read nor write—who can read and write imperfectly—who can read and write well—and who have a superior education.*

Attention will first be given to the first two classes of criminals. The various counties of England have been divided into six different groups, in the first two of which the ratio of crime does not differ by 15 per cent. above and below the average for England and Wales. In the next two groups the difference of crime is from 15 to 30 per cent. above and below the average. And in the last two groups the difference is at least 30 per cent. above and below the average respectively. For each of these groups the educational condition of the criminals has been abstracted; the detailed results of which are given in the preceding Table, XXIV, from which the following Abstract is taken:—

| Groups of Counties in which the                       | 1842-4.                                  |                                              |                                       |                        |                                       |                                          |                                              |                                       |                        |                                       |
|-------------------------------------------------------|------------------------------------------|----------------------------------------------|---------------------------------------|------------------------|---------------------------------------|------------------------------------------|----------------------------------------------|---------------------------------------|------------------------|---------------------------------------|
|                                                       | Above the Average Crime.                 |                                              |                                       |                        |                                       | Below the Average Crime.                 |                                              |                                       |                        |                                       |
|                                                       | Number who could neither Read nor Write. | Number who could Read and Write imperfectly. | Number who could Read and Write well. | Of superior Education. | Instruction could not be ascertained. | Number who could neither Read nor Write. | Number who could Read and Write imperfectly. | Number who could Read and Write well. | Of superior Education. | Instruction could not be ascertained. |
| Difference of crime under 15 per cent. }              | 6875                                     | 11071                                        | 1187                                  | 75                     | 422                                   | 2292                                     | 4859                                         | 746                                   | 23                     | 127                                   |
| Difference, 15 per cent. and under 30 per cent. . . } | 5332                                     | 10417                                        | 2364                                  | 71                     | 691                                   | 2414                                     | 5791                                         | 654                                   | 52                     | 166                                   |
| Difference, 30 per cent. and upwards }                | 3311                                     | 6381                                         | 724                                   | 71                     | 161                                   | 933                                      | 2186                                         | 150                                   | 9                      | 111                                   |

| Groups of Counties in which the                       | 1842-4.                                   |                                               |                                        |                              |                                       |                                           |                                               |                                        |                              |                                       |
|-------------------------------------------------------|-------------------------------------------|-----------------------------------------------|----------------------------------------|------------------------------|---------------------------------------|-------------------------------------------|-----------------------------------------------|----------------------------------------|------------------------------|---------------------------------------|
|                                                       | Above the Average Crime.                  |                                               |                                        |                              |                                       | Below the Average Crime.                  |                                               |                                        |                              |                                       |
|                                                       | Ratio which could neither Read nor Write. | Ratio which could Read and Write imperfectly. | Ratio which could Read and Write well. | Ratio of Superior Education. | Instruction could not be ascertained. | Ratio which could neither Read nor Write. | Ratio which could Read and Write imperfectly. | Ratio which could Read and Write well. | Ratio of Superior Education. | Instruction could not be ascertained. |
| Difference of crime under 15 per cent. }              | 35.8                                      | 57.6                                          | 6.2                                    | .4                           | 2.1                                   | 28.9                                      | 61.3                                          | 9.4                                    | .3                           | 1.6                                   |
| Difference, 15 per cent. and under 30 per cent. . . } | 29.3                                      | 57.3                                          | 13.0                                   | .4                           | 3.7                                   | 27.1                                      | 65.0                                          | 7.3                                    | .6                           | 1.8                                   |
| Difference, 30 per cent. and upwards }                | 31.6                                      | 60.8                                          | 6.9                                    | .7                           | 1.5                                   | 28.5                                      | 66.6                                          | 4.6                                    | .3                           | 3.3                                   |
| Total of these Districts . . . }                      | 32.4                                      | 58.2                                          | 8.9                                    | .5                           | 2.6                                   | 28.0                                      | 63.8                                          | 7.7                                    | .4                           | 2.0                                   |
| Ratio of England and Wales . . }                      | 31.3                                      | 59.8                                          | 8.5                                    | .44                          | 2.7                                   |                                           |                                               |                                        |                              |                                       |



| Group of Counties in which the                        | 1845-8.                                   |                                               |                                        |                              |                                       |                                           |                                               |                                        |                              |                                       |
|-------------------------------------------------------|-------------------------------------------|-----------------------------------------------|----------------------------------------|------------------------------|---------------------------------------|-------------------------------------------|-----------------------------------------------|----------------------------------------|------------------------------|---------------------------------------|
|                                                       | Above the Average Crime.                  |                                               |                                        |                              |                                       | Below the Average Crime.                  |                                               |                                        |                              |                                       |
|                                                       | Number who could neither Read nor Write.  | Number who could Read and Write imperfectly.  | Number who could Read and Write well.  | Of superior Education.       | Instruction could not be ascertained. | Number who could neither Read nor Write.  | Number who could Read and Write imperfectly.  | Number who could Read and Write well.  | Of superior Education.       | Instruction could not be ascertained. |
| Difference of crime under 15 per cent. }              | 7431                                      | 12777                                         | 1562                                   | 85                           | 362                                   | 3016                                      | 6905                                          | 903                                    | 35                           | 134                                   |
| Difference, 15 per cent. and under 30 per cent. . . } | 6911                                      | 13932                                         | 3212                                   | 59                           | 588                                   | 2980                                      | 6396                                          | 792                                    | 40                           | 175                                   |
| Difference, 30 per cent. and upwards }                | 3667                                      | 6785                                          | 1408                                   | 80                           | 172                                   | 1100                                      | 2574                                          | 179                                    | 15                           | 86                                    |
| Group of Counties in which the                        | 1845-8.                                   |                                               |                                        |                              |                                       |                                           |                                               |                                        |                              |                                       |
|                                                       | Above the Average Crime.                  |                                               |                                        |                              |                                       | Below the Average Crime.                  |                                               |                                        |                              |                                       |
|                                                       | Ratio which could neither Read nor Write. | Ratio which could Read and Write imperfectly. | Ratio which could Read and Write well. | Ratio of superior Education. | Instruction could not be ascertained. | Ratio which could neither Read nor Write. | Ratio which could Read and Write imperfectly. | Ratio which could Read and Write well. | Ratio of superior Education. | Instruction could not be ascertained. |
| Difference of crime under 15 per cent. }              | 34.0                                      | 58.5                                          | 7.1                                    | .4                           | 1.6                                   | 28.0                                      | 63.4                                          | 8.3                                    | .3                           | 1.2                                   |
| Difference, 15 per cent. and under 30 per cent. . . } | 28.7                                      | 57.8                                          | 13.3                                   | .2                           | 2.4                                   | 29.2                                      | 62.7                                          | 7.7                                    | .4                           | 1.7                                   |
| Difference, 30 per cent. and upwards }                | 30.7                                      | 56.8                                          | 11.8                                   | .7                           | 1.4                                   | 28.5                                      | 66.5                                          | 4.6                                    | .4                           | 2.2                                   |
| Total of these Districts . . . . }                    | 31.1                                      | 57.8                                          | 10.7                                   | .4                           | 1.9                                   | 28.5                                      | 63.6                                          | 7.5                                    | .4                           | 1.6                                   |
| Ratio of England and Wales . . }                      | 30.4                                      | 59.5                                          | 9.7                                    | .4                           | 1.9                                   |                                           |                                               |                                        |                              |                                       |

*Difference in favour of Education.*

|                                      | 1842-4.                                    |                                                | 1845-8.                                    |                                                |
|--------------------------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|------------------------------------------------|
|                                      | Of those who could neither Read nor Write. | Of those who could Read and Write imperfectly. | Of those who could neither Read nor Write. | Of those who could Read and Write imperfectly. |
|                                      |                                            |                                                |                                            |                                                |
| Difference of Crime 15 per cent. . . | 6.9                                        | 3.7                                            | 6.0                                        | 4.9                                            |
| ... 15 and under 30 .                | 2.2                                        | 7.7                                            | — 0.5                                      | 4.9                                            |
| ... 30 and upwards .                 | 3.1                                        | 5.2                                            | 2.2                                        | 9.7                                            |
| Total . . . . .                      | 4.4                                        | 5.6                                            | 4.6                                        | 5.8                                            |



It is thus seen, that in each group in which there is an increased amount of crime, there is invariably an increased ratio of criminals who can neither read nor write. Taking the three parallel groups of counties in which those characterised by crime above the average are compared with those below the average crime, it will be seen that during the period 1842-4 the difference of criminals unable either to read or write is respectively 6·9, 2·2, and 3·1 per cent. greater in the counties having an excess of crime. On the other hand, the proportion who can read and write imperfectly shews a corresponding increase in favour of the groups with a low ratio of crime, being respectively 3·7, and 7·7, and 5·2 per cent. Similar results appear for the period 1845-8.

The following are the results for the total of those counties in which crime is above and below the average respectively for the seven years 1842-8:—

|                                                        | Where Crime is<br>above the average. | Where Crime is<br>below the average. |
|--------------------------------------------------------|--------------------------------------|--------------------------------------|
| The per-centage that can neither read nor write is     | 32·75                                | 28·25                                |
| (Difference 4·5 per cent. in favour of Education.)     |                                      |                                      |
| The per-centage that can read and write imperfectly is | 58·0                                 | 63·7                                 |
| (Difference 5·7 per cent. in favour of Education.)     |                                      |                                      |

Thus far it would seem that the evidence furnished of education, among even the criminals themselves, tends to shew that the small amount of instruction implied in the test here recognised—the simple distinction between the ability to read and write imperfectly, and inability either to read or write at all—has a most material influence in the development of crime; and, were the investigation carried no further, we should be forced to conclude, that since the most criminal districts shew a higher ratio of uneducated persons among the criminals, and the less criminal districts a less proportion who are wholly destitute of the rudest elements of education, the immediate inference is, that even this small degree of instruction tends to the repression of crime.

Unless, however, this analysis were carried beyond its present limits, it may be objected, as in the former paper, that the peculiar results produced may be owing to some other cause than education. It may happen that differences of manufactures, of agriculture, of wealth, or of position in the social scale of society, existing in combination with the degree of crime already noticed, may be the real and active agent in producing the peculiar results attributed to education. In order, therefore, to see how far the facts of the case will support this view, a more refined analysis has been made of the various counties, placing them in groups, as in Table XVIII, in fact, placing them in groups so that they differ from each other only in their educational condition. It will thus be seen that the combinations now presented will exhibit all the methods by which the former analysis on pages 360-2 was brought to bear on the educational state of the whole community. And these have been further reduced to shew in precisely the same groups the degree of education among the criminal population. The results in detail of this particular portion of the inquiry will be found in the following Table XXVI.

[The following Abstract



*Educational Condition of Criminals according to the classification of TABLE XVIII.*

| Number and Ratio of Criminals in the Section of Inferior Degree of Education in the General Community. |                                   |                 |                                       |                 |                                |                 |                        |                 |                                       |        |        |
|--------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------|---------------------------------------|-----------------|--------------------------------|-----------------|------------------------|-----------------|---------------------------------------|--------|--------|
|                                                                                                        | Who could neither Read nor Write. |                 | Who could Read and Write Imperfectly. |                 | Who could Read and Write well. |                 | Of Superior Education. |                 | Instruction could not be ascertained. | Total. |        |
|                                                                                                        | Actual Number.                    | Prop. per cent. | Actual Number.                        | Prop. per cent. | Actual Number.                 | Prop. per cent. | Actual Number.         | Prop. per cent. |                                       |        |        |
| Least Agricultural . . .                                                                               | 5,849                             | 35.0            | 9,422                                 | 56.3            | 1,340                          | 8.0             | 121                    | .7              | 339                                   | 2.0    | 17,071 |
| Greatest . . .                                                                                         | 2,629                             | 31.5            | 4,798                                 | 57.5            | 822                            | 9.9             | 85                     | 1.0             | 153                                   | 1.8    | 8,487  |
| Greatest Manufacturing . .                                                                             | 1,772                             | 38.1            | 2,617                                 | 56.3            | 243                            | 5.2             | 16                     | .3              | 70                                    | 1.5    | 4,718  |
| Least . . .                                                                                            | 5,127                             | 35.1            | 8,328                                 | 57.1            | 1,033                          | 7.1             | 90                     | .6              | 314                                   | 2.1    | 14,892 |
| Manufacturing interest 33½ per cent. above the average                                                 | 1,907                             | 30.8            | 3,704                                 | 60.0            | 515                            | 8.3             | 54                     | .8              | 128                                   | 2.0    | 6,308  |
| Agricultural interest 50 per cent. above the average . .                                               | 1,035                             | 38.0            | 1,559                                 | 57.2            | 117                            | 4.3             | 12                     | .4              | 38                                    | 1.37   | 2,761  |
| Manufacturing and Agricultural interests nearly equal.                                                 | 5,980                             | 35.1            | 9,463                                 | 56.5            | 1,308                          | 7.7             | 119                    | .7              | 331                                   | 1.9    | 17,381 |
| Greatest wealth . . .                                                                                  | 2,760                             | 31.9            | 5,019                                 | 58.0            | 790                            | 9.1             | 83                     | .9              | 145                                   | 1.7    | 8,797  |
| Least wealth . . .                                                                                     | 2,071                             | 35.1            | 3,456                                 | 58.6            | 339                            | 5.7             | 31                     | .5              | 84                                    | 1.4    | 5,981  |
| Group in which those signing with "Marks" exceed the average by 33½ per cent . .                       | 1,703                             | 39.6            | 2,343                                 | 54.5            | 244                            | 5.7             | 9                      | .2              | 59                                    | 1.4    | 4,358  |
|                                                                                                        | 1,241                             | 28.1            | 2,820                                 | 63.8            | 345                            | 7.8             | 14                     | .3              | 95                                    | 2.1    | 4,515  |
|                                                                                                        | 1,357                             | 32.2            | 2,370                                 | 56.2            | 456                            | 10.8            | 30                     | .7              | 125                                   | 2.9    | 4,338  |
|                                                                                                        | 2,797                             | 36.9            | 4,344                                 | 57.2            | 416                            | 5.5             | 31                     | .4              | 149                                   | 1.9    | 7,727  |

Group in which those signing with "Marks" exceed the average by 33 $\frac{1}{3}$  per cent







*Educational Condition of Criminals during the Years 1845-8, according to the classification of TABLE XIX.—Males.*

| Number and Ratio of Criminals in the Section of Inferior Degree of Education in the General Community. |                                   |                 |                                       |                 |                                |                 |                        |                 |                                       |                 |        |
|--------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------|---------------------------------------|-----------------|--------------------------------|-----------------|------------------------|-----------------|---------------------------------------|-----------------|--------|
|                                                                                                        | Who could neither Read nor Write. |                 | Who could Read and Write Imperfectly. |                 | Who could Read and Write well. |                 | Of Superior Education. |                 | Instruction could not be ascertained. |                 | Total. |
|                                                                                                        | Actual Number.                    | Prop. per cent. | Actual Number.                        | Prop. per cent. | Actual Number.                 | Prop. per cent. | Actual Number.         | Prop. per cent. | Actual Number.                        | Prop. per cent. |        |
| Least Agricultural . . .                                                                               | 6,175                             | 32.39           | 11,201                                | 58.77           | 1,563                          | 8.21            | 120                    | 0.63            | 342                                   | 1.76            | 19,401 |
|                                                                                                        | 2,983                             | 31.83           | 5,364                                 | 57.25           | 950                            | 10.14           | 73                     | 0.78            | 181                                   | 1.90            | 9,551  |
|                                                                                                        | 1,962                             | 35.80           | 3,151                                 | 57.50           | 341                            | 6.22            | 26                     | 0.48            | 87                                    | 1.56            | 5,567  |
| Greatest . . . . .                                                                                     | 5,316                             | 32.71           | 9,653                                 | 59.41           | 1,188                          | 7.31            | 92                     | 0.57            | 315                                   | 1.90            | 16,564 |
|                                                                                                        | 2,124                             | 32.38           | 3,816                                 | 58.16           | 575                            | 8.77            | 45                     | 0.69            | 154                                   | 2.29            | 6,714  |
|                                                                                                        | 1,227                             | 36.10           | 1,966                                 | 57.84           | 189                            | 5.56            | 17                     | 0.50            | 51                                    | 1.48            | 3,450  |
| Manufacturing interest 33½ per cent. above the average                                                 | 6,307                             | 32.58           | 11,354                                | 58.65           | 1,576                          | 8.14            | 122                    | 0.63            | 343                                   | 1.74            | 19,702 |
|                                                                                                        | 3,115                             | 32.21           | 5,517                                 | 57.05           | 963                            | 9.96            | 75                     | 0.78            | 182                                   | 1.85            | 9,852  |
|                                                                                                        | 2,313                             | 33.10           | 4,171                                 | 59.68           | 474                            | 6.78            | 31                     | 0.44            | 103                                   | 1.45            | 7,092  |
| Agricultural interest 50 per cent. above the average . .                                               | 1,819                             | 40.46           | 2,308                                 | 51.33           | 368                            | 8.19            | 1                      | 0.02            | 56                                    | 1.23            | 4,552  |
|                                                                                                        | 1,648                             | 29.42           | 3,061                                 | 54.65           | 861                            | 15.38           | 31                     | 0.55            | 100                                   | 1.75            | 5,701  |
|                                                                                                        | 1,436                             | 31.48           | 2,668                                 | 58.47           | 436                            | 9.55            | 23                     | 0.50            | 125                                   | 2.67            | 4,688  |
| Manufacturing and Agricultural interest nearly equal .                                                 | 3,226                             | 35.37           | 5,282                                 | 57.92           | 571                            | 6.26            | 41                     | 0.45            | 168                                   | 1.81            | 9,288  |
|                                                                                                        |                                   |                 |                                       |                 |                                |                 |                        |                 |                                       |                 |        |
|                                                                                                        |                                   |                 |                                       |                 |                                |                 |                        |                 |                                       |                 |        |







The following Abstract has been made of Table XXVI.:—

| Groups of Counties.                                                                  | Number of Criminals during the years 1842—4 in the Sections of |                                                  |                                         |                                   |                                                  |                                                             |                                                  |                                         |                                   |                                                  |
|--------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------------------------------|
|                                                                                      | Inferior Degree of Education<br>in the General Community (a).  |                                                  |                                         |                                   |                                                  | Higher Degree of Education<br>in the General Community (b). |                                                  |                                         |                                   |                                                  |
|                                                                                      | Who could<br>neither<br>Read nor<br>Write.                     | Who could<br>Read and<br>Write im-<br>perfectly. | Who could<br>Read and<br>Write<br>well. | Of<br>Superior<br>Educa-<br>tion. | Instruc-<br>tion could<br>not be<br>ascertained. | Who could<br>neither<br>Read nor<br>Write.                  | Who could<br>Read and<br>Write im-<br>perfectly. | Who could<br>Read and<br>Write<br>well. | Of<br>Superior<br>Educa-<br>tion. | Instruc-<br>tion could<br>not be<br>ascertained. |
| Least Agricultural . . . .                                                           | 2,629                                                          | 4,798                                            | 822                                     | 85                                | 153                                              | 2,014                                                       | 4,553                                            | 538                                     | 16                                | 189                                              |
| Greatest ... . . . .                                                                 | 1,772                                                          | 2,617                                            | 243                                     | 16                                | 70                                               | 1,413                                                       | 3,065                                            | 277                                     | 28                                | 110                                              |
| Greatest Manufacturing . .                                                           | 1,907                                                          | 3,704                                            | 515                                     | 54                                | 128                                              | 1,422                                                       | 2,661                                            | 450                                     | 32                                | 56                                               |
| Least ... . . . .                                                                    | 1,035                                                          | 1,559                                            | 117                                     | 12                                | 38                                               | 949                                                         | 1,983                                            | 158                                     | 7                                 | 51                                               |
| Manufacturing interest 33½<br>per cent. above the average }                          | 2,760                                                          | 5,019                                            | 790                                     | 83                                | 145                                              | 1,164                                                       | 2,601                                            | 506                                     | 7                                 | 72                                               |
| Agricultural interest 50 per<br>cent. above the average }                            | 2,071                                                          | 3,456                                            | 339                                     | 31                                | 84                                               | 1,491                                                       | 3,002                                            | 243                                     | 13                                | 100                                              |
| Manufacturing and Agricul-<br>tural interests nearly equal }                         | 1,703                                                          | 2,343                                            | 244                                     | 9                                 | 59                                               | 880                                                         | 1,757                                            | 211                                     | 14                                | 81                                               |
| Greatest Wealth . . . . .                                                            | 1,241                                                          | 2,820                                            | 345                                     | 14                                | 95                                               | 672                                                         | 1,455                                            | 372                                     | 6                                 | 40                                               |
| Least Wealth . . . . .                                                               | 1,357                                                          | 2,370                                            | 456                                     | 30                                | 125                                              | 1,071                                                       | 2,046                                            | 167                                     | 9                                 | 81                                               |
| Total . . . . .                                                                      | 16,475                                                         | 28,686                                           | 3,871                                   | 334                               | 897                                              | 11,076                                                      | 23,123                                           | 2,922                                   | 132                               | 780                                              |
| "Marks," 33½ per cent. above<br>the average, and 25 per<br>cent. below the average } | 2,797                                                          | 4,334                                            | 416                                     | 31                                | 149                                              | 1,826                                                       | 3,726                                            | 678                                     | 23                                | 136                                              |

| Groups of Counties.                                                                  | Ratio of Criminals during the years 1842—4 in the Sections of |                                                  |                                         |                                   |                                                  |                                                            |                                                  |                                         |                                   |                                                  |
|--------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------------------------------|------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------------------------------|
|                                                                                      | Inferior Degree of Education<br>in the General Community (a). |                                                  |                                         |                                   |                                                  | Higher Degree of Education<br>in the General Community (b) |                                                  |                                         |                                   |                                                  |
|                                                                                      | Who could<br>neither<br>Read nor<br>Write.                    | Who could<br>Read and<br>Write im-<br>perfectly. | Who could<br>Read and<br>Write<br>well. | Of<br>superior<br>Educa-<br>tion. | Instruc-<br>tion could<br>not be<br>ascertained. | Who could<br>neither<br>Read nor<br>Write.                 | Who could<br>Read and<br>Write im-<br>perfectly. | Who could<br>Read and<br>Write<br>well. | Of<br>Superior<br>Educa-<br>tion. | Instruc-<br>tion could<br>not be<br>ascertained. |
| Least Agricultural . . . .                                                           | 31.5                                                          | 57.5                                             | 9.9                                     | 1.0                               | 1.8                                              | 28.3                                                       | 63.9                                             | 7.5                                     | .2                                | 2.6                                              |
| Greatest ... . . . .                                                                 | 38.1                                                          | 56.3                                             | 5.2                                     | .3                                | 1.5                                              | 29.5                                                       | 64.1                                             | 5.8                                     | .5                                | 2.3                                              |
| Greatest Manufacturing . .                                                           | 30.8                                                          | 60.0                                             | 8.3                                     | .8                                | 2.0                                              | 31.1                                                       | 58.3                                             | 9.9                                     | .7                                | 1.2                                              |
| Least ... . . . .                                                                    | 38.0                                                          | 57.2                                             | 4.3                                     | .4                                | 1.4                                              | 30.6                                                       | 64.0                                             | 5.1                                     | .2                                | 1.6                                              |
| Manufacturing interest 33½<br>per cent. above the average }                          | 31.9                                                          | 58.0                                             | 9.1                                     | .9                                | 1.7                                              | 27.2                                                       | 60.8                                             | 11.8                                    | .2                                | 1.7                                              |
| Agricultural interest 50 per<br>cent. above the average }                            | 35.1                                                          | 58.6                                             | 5.7                                     | .5                                | 1.4                                              | 31.4                                                       | 63.2                                             | 5.1                                     | .3                                | 2.0                                              |
| Manufacturing and Agricul-<br>tural interests nearly equal }                         | 39.6                                                          | 54.5                                             | 5.7                                     | .2                                | 1.4                                              | 30.7                                                       | 61.4                                             | 7.4                                     | .5                                | 2.7                                              |
| Greatest Wealth . . . . .                                                            | 28.1                                                          | 63.8                                             | 7.8                                     | .3                                | 2.1                                              | 26.8                                                       | 58.1                                             | 14.9                                    | .2                                | 1.6                                              |
| Least Wealth . . . . .                                                               | 32.2                                                          | 56.2                                             | 10.8                                    | .7                                | 2.9                                              | 32.5                                                       | 62.1                                             | 5.1                                     | .3                                | 2.4                                              |
| Total . . . . .                                                                      | 32.8                                                          | 57.1                                             | 7.7                                     | .6                                | 1.8                                              | 29.1                                                       | 60.8                                             | 7.7                                     | .3                                | 2.1                                              |
| "Marks," 33½ per cent. above<br>the average, and 25 per<br>cent. below the average } | 36.9                                                          | 57.2                                             | 5.5                                     | .4                                | 1.9                                              | 29.2                                                       | 59.6                                             | 10.8                                    | .4                                | 2.1                                              |



*Abstract taken from TABLE XXVII.*

| Group of Counties.                                                                  | Number of Criminals during the Years 1845-8 in the Sections of |                                                  |                                         |                                   |                                                  |                                                             |                                                  |                                         |                                   |                                                  |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------------------------------|
|                                                                                     | Inferior Degree of Education<br>in the General Community (a).  |                                                  |                                         |                                   |                                                  | Higher Degree of Education<br>in the General Community (b). |                                                  |                                         |                                   |                                                  |
|                                                                                     | Who could<br>neither<br>Read nor<br>Write.                     | Who could<br>Read and<br>Write im-<br>perfectly. | Who could<br>Read and<br>Write<br>well. | Of<br>Superior<br>Educa-<br>tion. | Instruc-<br>tion could<br>not be<br>ascertained. | Who could<br>neither<br>Read nor<br>Write.                  | Who could<br>Read and<br>Write im-<br>perfectly. | Who could<br>Read and<br>Write<br>well. | Of<br>Superior<br>Educa-<br>tion. | Instruc-<br>tion could<br>not be<br>ascertained. |
| Least Agricultural . . . . .                                                        | 2,983                                                          | 5,364                                            | 950                                     | 73                                | 181                                              | 2,283                                                       | 5,304                                            | 1,123                                   | 37                                | 161                                              |
| Greatest . . . . .                                                                  | 1,962                                                          | 3,151                                            | 341                                     | 26                                | 87                                               | 1,846                                                       | 3,665                                            | 346                                     | 18                                | 71                                               |
| Greatest Manufacturing . . . . .                                                    | 2,124                                                          | 3,816                                            | 575                                     | 45                                | 154                                              | 1,466                                                       | 2,971                                            | 611                                     | 32                                | 65                                               |
| Least . . . . .                                                                     | 1,227                                                          | 1,966                                            | 189                                     | 17                                | 51                                               | 1,201                                                       | 2,323                                            | 190                                     | 7                                 | 35                                               |
| Manufacturing interest 33½<br>per cent. above the average }                         | 3,115                                                          | 5,517                                            | 963                                     | 75                                | 182                                              | 1,324                                                       | 3,410                                            | 682                                     | 11                                | 82                                               |
| Agricultural interest 50 per<br>cent. above the average }                           | 2,313                                                          | 4,171                                            | 474                                     | 31                                | 103                                              | 1,499                                                       | 3,692                                            | 287                                     | 14                                | 70                                               |
| Manufacturing and Agricul-<br>tural interests nearly equal }                        | 1,819                                                          | 2,308                                            | 368                                     | 1                                 | 56                                               | 1,229                                                       | 2,479                                            | 255                                     | 25                                | 72                                               |
| Greatest Wealth . . . . .                                                           | 1,648                                                          | 3,061                                            | 861                                     | 31                                | 100                                              | 971                                                         | 2,500                                            | 506                                     | 12                                | 60                                               |
| Least Wealth . . . . .                                                              | 1,436                                                          | 2,668                                            | 436                                     | 23                                | 125                                              | 1,178                                                       | 2,496                                            | 198                                     | 12                                | 78                                               |
| Total . . . . .                                                                     | 18,627                                                         | 32,022                                           | 5,157                                   | 322                               | 1,039                                            | 13,447                                                      | 28,840                                           | 4,198                                   | 167                               | 694                                              |
| "Marks" 33½ per cent. above<br>the average, and 25 per<br>cent. below the average } | 3,226                                                          | 5,282                                            | 571                                     | 41                                | 168                                              | 2,539                                                       | 5,449                                            | 880                                     | 29                                | 172                                              |

| Group of Counties.                                                                  | Ratio of Criminals during the Years 1845-8 in the Sections of |                                                  |                                         |                                   |                                                  |                                                             |                                                  |                                         |                                   |                                                  |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------|-----------------------------------------|-----------------------------------|--------------------------------------------------|
|                                                                                     | Inferior Degree of Education<br>in the General Community (a). |                                                  |                                         |                                   |                                                  | Higher Degree of Education<br>in the General Community (b). |                                                  |                                         |                                   |                                                  |
|                                                                                     | Who could<br>neither<br>Read nor<br>Write.                    | Who could<br>Read and<br>Write im-<br>perfectly. | Who could<br>Read and<br>Write<br>well. | Of<br>Superior<br>Educa-<br>tion. | Instruc-<br>tion could<br>not be<br>ascertained. | Who could<br>neither<br>Read nor<br>Write.                  | Who could<br>Read and<br>Write im-<br>perfectly. | Who could<br>Read and<br>Write<br>well. | Of<br>Superior<br>Educa-<br>tion. | Instruc-<br>tion could<br>not be<br>ascertained. |
| Least Agricultural . . . . .                                                        | 31.8                                                          | 57.3                                             | 10.1                                    | .8                                | 1.9                                              | 26.1                                                        | 60.6                                             | 12.9                                    | .4                                | 1.8                                              |
| Greatest . . . . .                                                                  | 35.8                                                          | 57.5                                             | 6.2                                     | .5                                | 1.6                                              | 31.4                                                        | 62.4                                             | 5.9                                     | .3                                | 1.2                                              |
| Greatest Manufacturing . . . . .                                                    | 32.4                                                          | 58.2                                             | 8.7                                     | .7                                | 2.3                                              | 28.9                                                        | 58.5                                             | 12.0                                    | .6                                | 1.3                                              |
| Least . . . . .                                                                     | 36.1                                                          | 57.8                                             | 5.6                                     | .5                                | 1.5                                              | 32.3                                                        | 62.4                                             | 5.1                                     | .2                                | .9                                               |
| Manufacturing interest 33½<br>per cent. above the average }                         | 32.2                                                          | 57.0                                             | 10.0                                    | .8                                | 1.9                                              | 24.4                                                        | 62.8                                             | 12.6                                    | .2                                | 1.5                                              |
| Agricultural interest 50 per<br>cent. above the average }                           | 33.1                                                          | 59.7                                             | 6.8                                     | .4                                | 1.5                                              | 32.8                                                        | 62.2                                             | 4.8                                     | .2                                | 1.2                                              |
| Manufacturing and Agricul-<br>tural interests nearly equal }                        | 40.5                                                          | 51.3                                             | 8.2                                     | .0                                | 1.2                                              | 30.8                                                        | 62.2                                             | 6.4                                     | .6                                | 1.8                                              |
| Greatest Wealth . . . . .                                                           | 29.4                                                          | 54.6                                             | 13.4                                    | .6                                | 1.8                                              | 24.3                                                        | 62.7                                             | 12.7                                    | .3                                | 1.5                                              |
| Least Wealth . . . . .                                                              | 31.5                                                          | 58.5                                             | 9.5                                     | .5                                | 2.7                                              | 30.3                                                        | 64.3                                             | 5.1                                     | .3                                | 2.0                                              |
| Total . . . . .                                                                     | 33.2                                                          | 57.0                                             | 9.2                                     | .6                                | 1.8                                              | 28.8                                                        | 61.8                                             | 9.0                                     | .4                                | 1.4                                              |
| "Marks" 33½ per cent. above<br>the average, and 25 per<br>cent. below the average } | 35.4                                                          | 57.9                                             | 6.3                                     | .4                                | 1.8                                              | 28.5                                                        | 61.3                                             | 9.9                                     | .3                                | 1.9                                              |

The following results are deduced from the figures given in the second sections of the Abstracts in this and the preceding page.



| Difference in favour of Education during 1842-8.                                                          |                                                  |                                                      |                                               |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------------------------------------------------|-----------------------------------------------|
|                                                                                                           | Of those who<br>could neither<br>Read nor Write. | Of those who<br>could Read and<br>Write imperfectly. | Of those who<br>could Read and<br>Write well. |
| Group of Least Agricultural . . . . .                                                                     | 4.4                                              | 4.8                                                  | .2                                            |
| ... Greatest ... . . . .                                                                                  | 6.5                                              | 6.3                                                  | — 1.1                                         |
| ... Greatest Manufacturing . . . . .                                                                      | 1.6                                              | — .7                                                 | 2.4                                           |
| ... Least ... . . . .                                                                                     | 5.6                                              | 5.7                                                  | .1                                            |
| ... Manufacturing interest $33\frac{1}{3}$ per cent. above the average                                    | 6.2                                              | 4.3                                                  | 2.7                                           |
| ... Agricultural interest 50 per cent. above the average                                                  | 2.0                                              | 3.5                                                  | — 1.3                                         |
| ... Manufacturing and Agricultural interests nearly equal                                                 | 9.3                                              | 8.9                                                  | — .1                                          |
| ... Greatest Wealth . . . . .                                                                             | 3.2                                              | 1.2                                                  | 3.2                                           |
| ... Least Wealth . . . . .                                                                                | .4                                               | 5.8                                                  | — 5.1                                         |
| Total . . . . .                                                                                           | 4.0                                              | 4.2                                                  | — .1                                          |
| “ Marks” $33\frac{1}{3}$ per cent. above the average, and 25 per cent. }<br>below the average . . . . . } | 7.3                                              | 2.9                                                  | 4.4                                           |

A remarkable feature presents itself in these Abstracts. The form in which they are arranged shews not only districts in which there is an inferior degree of education in the general community, accompanied with an increased amount of criminals, but also at the same time an increased ratio of uninstructed criminals in the same districts, compared with that in the higher educated districts, and a reduced rate of crime. The agreement, therefore, of those two very different educational tests, and their general assimilation throughout, may be safely regarded as sufficient indications of the relative amount of actual education in the respective districts; and, consequently, should any uniform or constant increase or decrease of crime be found to fluctuate with the amount of education thus determined, it will furnish the argument for or against the influence of education on the development of crime.

From the preceding Abstract however, it appears that in all the eleven combinations represented there is a marked difference in favour of education; or, in other words, there is constantly an increased ratio of uninstructed criminals where crime is above the average, and also a reduced ratio of uninstructed criminals where crime is at a lower ebb. In the greatest agricultural district it will be seen that in the group in which crime is least, there is 6.5 per cent. less of uninstructed criminals than in the other group of the districts where a higher ratio of crime prevails. Again, take the districts in which the manufacturing and agricultural interests are nearly equal, and it will be found that in the group of least crime, there is 9.3 per cent. less of uninstructed criminals than in the parallel group of higher crime. Also, take the groups representing those districts of the country in which persons who marry signing the register with their marks, exceed the average of the country by  $33\frac{1}{3}$  per cent., and likewise in which those so signing are less than the average by 25 per cent., and it will be found that the former shews an increase of 43.9 per cent. during 1842-4, and of 35.6 per cent. during 1845-8 of crime over the latter district, and at the same time an increase of 7.3 per cent. of uninstructed criminals throughout the whole period. In this instance, as well as in all the others referred to in the same Abstract, we may observe the following most important combination repre-

[sented :—the districts



TABLE XXVIII.

*Shewing the relative degree of Instruction among Criminals in each class of Offences.—Males and Females.*  
1836-7-8-9.

| Division of Offences. | Neither Read nor Write. |          | Read and Write imperfectly. |          | Read and Write well. |          | Superior Instruction. |          | Instruction could not be ascertained. |          | Total Number of Offenders. |          |       |
|-----------------------|-------------------------|----------|-----------------------------|----------|----------------------|----------|-----------------------|----------|---------------------------------------|----------|----------------------------|----------|-------|
|                       | Males.                  | Females. | Males.                      | Females. | Males.               | Females. | Males.                | Females. | Males.                                | Females. | Males.                     | Females. |       |
| Div. (1) {            | 1836. .                 | 419      | 61                          | 844      | 101                  | 302      | 20                    | 48       | ...                                   | 146      | 15                         | 1759     | 197   |
|                       | 1837. .                 | 422      | 59                          | 709      | 95                   | 252      | 6                     | 20       | 1                                     | 135      | 20                         | 1538     | 181   |
|                       | 1838. .                 | 454      | 59                          | 776      | 97                   | 276      | 16                    | 23       | 1                                     | 143      | 14                         | 1672     | 187   |
|                       | 1839. .                 | 438      | 50                          | 909      | 108                  | 283      | 24                    | 21       | ...                                   | 155      | 21                         | 1806     | 203   |
|                       | Total . . .             | 1733     | 229                         | 3238     | 401                  | 1113     | 66                    | 112      | 2                                     | 579      | 70                         | 6775     | 768   |
| Ratio per cent. . .   | 27.97                   | 32.81    | 52.26                       | 57.45    | 17.96                | 9.45     | 1.81                  | .29      | ...                                   | ...      | ...                        | ...      |       |
| Div. (2) {            | 1836. .                 | 380      | 29                          | 686      | 40                   | 150      | 2                     | 8        | ...                                   | 14       | 1                          | 1238     | 72    |
|                       | 1837. .                 | 472      | 33                          | 732      | 35                   | 117      | 3                     | 2        | ...                                   | 6        | ...                        | 1329     | 71    |
|                       | 1838. .                 | 510      | 41                          | 809      | 33                   | 129      | 6                     | 1        | ...                                   | 9        | ...                        | 1458     | 80    |
|                       | 1839. .                 | 455      | 41                          | 767      | 41                   | 112      | 2                     | 1        | ...                                   | 13       | ...                        | 1348     | 84    |
|                       | Total . . .             | 1817     | 144                         | 2994     | 149                  | 508      | 13                    | 12       | ...                                   | 42       | 1                          | 5373     | 307   |
| Ratio per cent. . .   | 34.08                   | 47.06    | 56.16                       | 48.69    | 9.53                 | 4.25     | .23                   | ...      | ...                                   | ...      | ...                        | ...      |       |
| Div. (3) {            | 1836. .                 | 4460     | 1257                        | 6789     | 1767                 | 1386     | 164                   | 92       | 14                                    | 195      | 43                         | 12922    | 3245  |
|                       | 1837. .                 | 5420     | 1556                        | 8076     | 1897                 | 1506     | 146                   | 59       | 2                                     | 170      | 52                         | 15231    | 3653  |
|                       | 1838. .                 | 5102     | 1420                        | 7882     | 2040                 | 1469     | 159                   | 34       | 4                                     | 141      | 27                         | 14628    | 3650  |
|                       | 1839. .                 | 5206     | 1526                        | 8105     | 2298                 | 1594     | 211                   | 30       | 4                                     | 217      | 52                         | 15152    | 4091  |
|                       | Total . . .             | 20188    | 5759                        | 30852    | 8002                 | 5955     | 680                   | 215      | 24                                    | 723      | 174                        | 57933    | 14639 |
| Ratio per cent. . .   | 35.29                   | 39.81    | 53.93                       | 55.32    | 10.41                | 4.70     | .37                   | .17      | ...                                   | ...      | ...                        | ...      |       |
| Div. (4) {            | 1836. .                 | 47       | 6                           | 76       | 6                    | 23       | ...                   | 2        | ...                                   | 8        | ...                        | 156      | 12    |
|                       | 1837. .                 | 34       | 4                           | 45       | 8                    | 12       | ...                   | 2        | ...                                   | 9        | ...                        | 102      | 12    |
|                       | 1838. .                 | 23       | 2                           | 47       | 8                    | 7        | ...                   | 1        | ...                                   | 1        | ...                        | 79       | 10    |
|                       | 1839. .                 | 40       | 2                           | 35       | 8                    | 18       | ...                   | ...      | ...                                   | 2        | ...                        | 95       | 10    |
|                       | Total . . .             | 144      | 14                          | 203      | 30                   | 60       | ...                   | 5        | ...                                   | 20       | ...                        | 432      | 44    |
| Ratio per cent. . .   | 34.95                   | 31.82    | 49.27                       | 68.18    | 14.56                | ...      | 1.22                  | ...      | ...                                   | ...      | ...                        | ...      |       |
| Div. (5) {            | 1836. .                 | 65       | 38                          | 162      | 30                   | 47       | 5                     | 11       | ...                                   | ...      | 1                          | 285      | 74    |
|                       | 1837. .                 | 94       | 67                          | 185      | 48                   | 51       | 4                     | 7        | ...                                   | ...      | ...                        | 337      | 119   |
|                       | 1838. .                 | 87       | 44                          | 205      | 66                   | 87       | 5                     | 6        | ...                                   | 2        | 1                          | 387      | 116   |
|                       | 1839. .                 | 80       | 47                          | 170      | 50                   | 71       | 10                    | 6        | ...                                   | 2        | ...                        | 329      | 107   |
|                       | Total . . .             | 326      | 196                         | 722      | 194                  | 256      | 24                    | 30       | ...                                   | 4        | 2                          | 1338     | 416   |
| Ratio per cent. . .   | 24.44                   | 47.34    | 54.12                       | 46.86    | 19.19                | 5.80     | 2.25                  | ...      | ...                                   | ...      | ...                        | ...      |       |
| Div. (6) {            | 1836. .                 | 227      | 44                          | 411      | 71                   | 108      | 8                     | 15       | 1                                     | 127      | 12                         | 888      | 136   |
|                       | 1837. .                 | 242      | 61                          | 400      | 68                   | 119      | 18                    | 8        | ...                                   | 101      | 22                         | 870      | 169   |
|                       | 1838. .                 | 166      | 35                          | 289      | 82                   | 83       | 20                    | 9        | ...                                   | 134      | 9                          | 681      | 146   |
|                       | 1839. .                 | 268      | 43                          | 537      | 43                   | 123      | 14                    | 16       | ...                                   | 157      | 17                         | 1101     | 117   |
|                       | Total . . .             | 903      | 183                         | 1637     | 264                  | 433      | 60                    | 48       | 1                                     | 519      | 60                         | 3540     | 568   |
| Ratio per cent. . .   | 29.89                   | 36.02    | 54.19                       | 51.97    | 14.33                | 11.81    | 1.59                  | .20      | ...                                   | ...      | ...                        | ...      |       |
| Grand Total .         | 25111                   | 6525     | 39646                       | 9040     | 8325                 | 843      | 422                   | 27       | 1887                                  | 307      | 75391                      | 16742    |       |
| Ratio per cent. .     | 34.16                   | 39.70    | 53.94                       | 55.00    | 11.33                | 5.13     | .57                   | .17      | ...                                   | ...      | ...                        | ...      |       |



sented:—the districts of the country in which the general population is worst educated, the districts in which the greatest amount of crime prevails, and the districts in which there is the highest proportion of uninstructed criminals, are found constantly assimilating; while, on the other side of the question, we have to view those districts of the country which are best educated, the least criminal, and in which a less proportion is found of uninstructed criminals, identified. Since it thus appears, by adopting either of the available tests of education, that crime and ignorance are constant companions, prevention being better than cure, it becomes an important, if not an imperative duty, to reduce the amount of crime by the simple means of a good general education. As already stated, education in its higher sense must of necessity dis severate itself from crime, and this eminent degree of education will perhaps be long impossible of attainment to the whole population of any country; but there seem to be no insuperable difficulties in the way of imparting to the bulk of a community something above the mere elements of reading and writing at least; and in this limited sense it is evident there is to be found a powerful check on crime, and no doubt the most efficient means of subduing the evil propensities of the people.

In the preceding Table XXVIII, an analysis will be found of the educational condition of criminals during the years 1836, 7, 8, 9, for each of the six classes of crime given in the Home Office Returns.

1. Offences against the person.
2. Offences against property committed with violence.
3. Offences against property committed without violence.
4. Malicious offences against property.
5. Forgery and other offences against the currency.
6. Other offences.

The facts were thrown into this form with a view to determine, if possible, whether there was any, and what difference in the education of criminals committed for various classes of offences. It will be seen from the following abstract of this Table, that the proportion of criminals who could neither read nor write was highest in the class (3) for offences against property committed without violence, and least in the class (5) of forgery and other offences against the currency; being 35·29 in the former, and 24·44 in the latter, who could neither read nor write. Again, the ratio of those who could *read and write well* was least in the class (2) of offences against property committed with violence, being 9·53 per cent., and highest in the class (5) of forgery and other offences against the currency; and those of superior instruction were also lowest and highest in the same two classes, being only ·23 in the former class, and 2·25 in the latter. The results for the whole of these classes combined during the same years, were of those who can—

|                                      |                 |
|--------------------------------------|-----------------|
| Neither read nor write . . . . .     | 34·16 per cent. |
| Read and write imperfectly . . . . . | 53·94 ...       |
| Read and write well . . . . .        | 11·33 ...       |
| Superior instruction . . . . .       | 0·57 ...        |



## MALES.

| Degree of Instruction.                                        | Division<br>(1) | Division<br>(2) | Division<br>(3) | Division<br>(4) | Division<br>(5) | Division<br>(6) | Total. |
|---------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------|
| Number who could neither read nor write . . . . . }           | 1733            | 1817            | 20188           | 144             | 236             | 903             | 25111  |
| Number who could read and write imperfectly . . . . . }       | 3238            | 2994            | 30852           | 203             | 722             | 1637            | 39646  |
| Number who could read and write well                          | 1113            | 508             | 5955            | 60              | 256             | 433             | 8325   |
| Number possessed of superior instruction . . . . . }          | 112             | 12              | 215             | 5               | 30              | 48              | 422    |
| Number whose instruction could not be ascertained . . . . . } | 579             | 42              | 723             | 20              | 4               | 519             | 1887   |
| Total number of offenders in each class                       | 6775            | 5373            | 57933           | 432             | 1338            | 3540            | 75391  |

## MALES.

| Degree of Instruction.                                 | Division<br>(1) | Division<br>(2) | Division<br>(3) | Division<br>(4) | Division<br>(5) | Division<br>(6) | Total. |
|--------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------|
| Ratio who could neither read nor write                 | 27.97           | 34.08           | 35.29           | 34.95           | 24.44           | 29.89           | 34.16  |
| Ratio who could read and write imperfectly . . . . . } | 52.26           | 56.16           | 53.93           | 49.27           | 54.12           | 54.19           | 53.94  |
| Ratio who could read and write well .                  | 17.96           | 9.53            | 10.41           | 14.56           | 19.19           | 14.33           | 11.33  |
| Ratio of superior instruction . . . . .                | 1.81            | .23             | .37             | 1.22            | 2.25            | 1.59            | .57    |

The following Abstract will shew the results for the same four years for the female sex :—

## FEMALES.

| Degree of Instruction.                                        | Division<br>(1) | Division<br>(2) | Division<br>(3) | Division<br>(4) | Division<br>(5) | Division<br>(6) | Total. |
|---------------------------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------|
| Number who could neither read nor write . . . . . }           | 229             | 144             | 5759            | 14              | 196             | 183             | 6525   |
| Number who could read and write imperfectly . . . . . }       | 401             | 149             | 8002            | 30              | 194             | 264             | 9040   |
| Number who could read and write well                          | 66              | 13              | 680             | ...             | 24              | 60              | 843    |
| Number possessed of superior instruction . . . . . }          | 2               | ...             | 24              | ...             | ...             | 1               | 27     |
| Number whose instruction could not be ascertained . . . . . } | 70              | 1               | 174             | ...             | 2               | 60              | 307    |
| Total number of offenders in each class                       | 768             | 307             | 14639           | 44              | 416             | 568             | 16742  |



## FEMALES.

| Degree of Instruction.                 | Division<br>(1) | Division<br>(2) | Division<br>(3) | Division<br>(4) | Division<br>(5) | Division<br>(6) | Total. |
|----------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|--------|
| Ratio who could neither read nor write | 32.81           | 47.06           | 39.81           | 31.82           | 47.34           | 36.02           | 39.70  |
| ... could read & write imperfectly     | 57.45           | 48.69           | 55.32           | 68.18           | 46.86           | 51.97           | 55.00  |
| ... could read and write well . .      | 9.46            | 4.25            | 4.70            | ...             | 5.80            | 11.81           | 5.13   |
| ... of superior instruction . . . .    | .29             | ...             | .17             | ...             | ...             | .20             | .17    |

The ratio of those who could neither read nor write is thus lowest for class (4), and highest for class (5), being 31.82 per cent. in the former, and 47.34 in the latter ; but during those four years it appears that in the class (4), for malicious offences against property, there was not a single one in the whole of England and Wales returned as being able to read and write well, or as possessing superior instruction ; so also in the class (2), of offences against property committed with violence, and in the class (5), of forgery and other offences against the currency, not a single instance occurred in the whole kingdom during those years, of a person being committed possessing superior instruction. Amongst females, class (1), including the offences against the person, seems to be the most remarkable, as the ratio of those who could

Neither read nor write, was . . . . . 32.81 per cent.

Read and write imperfectly . . . . . 57.45 ...

Read and write well . . . . . 9.46 ...

The following will exhibit the relative degrees of education in the aggregate of the criminal classes of both sexes during the years 1836, 1837, 1838, and 1839.

| Degree of Instruction.                   | Males. | Females. | Difference. |
|------------------------------------------|--------|----------|-------------|
| Ratio who can neither read nor write . . | 34.16  | 39.70    | — 3.54      |
| ... can read and write imperfectly       | 53.94  | 55.00    | — 1.06      |
| ... can read and write well . .          | 11.33  | 5.13     | + 6.20      |
| ... of superior instruction . . . .      | 0.57   | 0.17     | + 0.50      |

It will thus be seen, that although a higher ratio of females were able to read and write imperfectly, still a greater proportion of females could not read or write at all ; and, while 5.13 per cent. only of females could read and write well, there was 11.33 per cent. of the males who were equally instructed.

It may appear anomalous, while education is held to have so powerful an influence in repressing crime, and the female criminals are less educated than the males, that the ratio of crime is not also greater in the female sex. This argument, however, would be based on a very narrow and limited view of the question, for the application of the mere test of education itself will not always be sufficient to determine the relative amount of crime. Before applying this or any other test, it is necessary, in order to see its full influence or effect, that the two districts or groups compared should be similar in all other conditions, social and otherwise, and simply differing in regard to the one element, the



force of which it was proposed to measure. Among the various elements influencing crime, sex has already been shewn to be a most important one, as on the aggregate of ages the tendency to crime in the male sex was to that in the female sex, as  $\cdot 2978$  is to  $\cdot 0633$ —in fact, nearly as five to one. It is not enough to take into view simply the mental and moral conditions of the mind itself, but those conditions in relation to external circumstances and the state of society; and whatever may be the state of education and the natural feelings and passions peculiar to the female mind, sufficient has been shewn in the former paper, to prove that the difference in her social position in this country exposes her to less temptations to crime. In like manner does the same evidence prove, that while the state of education remains unaltered or constant in the country, crime may be fluctuating or gradually increasing or decreasing under the influence of the altered external circumstances with which man is surrounded; so also may the education of the people increase and become more general—as appears to be the case from the facts disclosed by the registers of marriage, which shew that the proportion of males signing the register with marks has gradually changed from 33·7 per cent. in 1839, to 31·2 per cent. in 1848; while, during the same years, the proportion of male criminals that can neither read nor write has decreased from 33·53 per cent. to 31·9 per cent.; and all this time crime may have likewise increased, but still it will remain a fact, that education counteracts the tendency, so long as the criminal returns shew that, everything else being the same, crime is at a minimum where education is at a maximum, and that where education is least, crime is highest. Changes in the political, manufacturing, and commercial aspects of the country—alterations in the police and criminal laws—have all their influence; and although for a period, or even a long series of years, crime may be on the increase, education may still be importantly concerned in the development or repression of crime.

Nothing has yet been said on the nature and extent of the various descriptions of crimes and offences. In the early part of this communication it was shewn, that in investigating the question of crime in its aggregate character, no satisfactory or true results could possibly be obtained, unless the element of age entered into the inquiry. If it be, then, so essential an element in discussing the question of crime in its general aspect, it must be evident that in its specific form there is still less chance of success, when without the means of employing the element of age. It is, therefore, to be lamented, that although in the Home Office Returns the number of criminals guilty of particular offences is given, no mention is made of their ages in connection with specific forms of crime. This defect might easily be remedied. Local and provincial police-courts and districts have seen the value of such information; and it is to be regretted that the authorities at head-quarters should still be indifferent to the great advantages that must result from affording inquirers into criminal statistics a means of introducing so important an element into their investigations.

[It was not known



TABLE XXIX.

*Shewing the Age and Sex of the total number of Persons Committed for Trial or Bailed in 1834, 5, 6, 7, 8, and 9.*  
*Males and Females.*

| Division of Offences.                                        | Aged 12 years and under. |          | Aged 16 years and above 12. |          | Aged 21 years and above 16. |          | Aged 30 years and above 21. |          | Aged 40 years and above 30. |          | Aged 50 years and above 40. |          | Aged 60 years and above 50. |          | Aged above 60 years. |          | Age could not be ascertained. |          | Total Number of Offenders. |          |
|--------------------------------------------------------------|--------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|----------------------|----------|-------------------------------|----------|----------------------------|----------|
|                                                              | Males.                   | Females. | Males.                      | Females. | Males.                      | Females. | Males.                      | Females. | Males.                      | Females. | Males.                      | Females. | Males.                      | Females. | Males.               | Females. | Males.                        | Females. | Males.                     | Females. |
| Division (1)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | 5                        | 3        | 52                          | 3        | 466                         | 28       | 804                         | 82       | 346                         | 39       | 175                         | 23       | 80                          | 10       | 43                   | 2        | 253                           | 41       | 2224                       | 231      |
|                                                              | 3                        | 1        | 57                          | 8        | 339                         | 41       | 670                         | 65       | 352                         | 55       | 149                         | 26       | 73                          | 12       | 24                   | 4        | 123                           | 14       | 1790                       | 226      |
|                                                              | 4                        | ...      | 59                          | 7        | 364                         | 25       | 669                         | 64       | 305                         | 44       | 136                         | 30       | 71                          | 6        | 31                   | 6        | 120                           | 15       | 1759                       | 197      |
|                                                              | 2                        | ...      | 34                          | 3        | 301                         | 28       | 610                         | 76       | 281                         | 43       | 110                         | 17       | 63                          | 4        | 25                   | 3        | 112                           | 17       | 1538                       | 181      |
|                                                              | 5                        | ...      | 46                          | 1        | 339                         | 36       | 615                         | 67       | 301                         | 37       | 141                         | 15       | 57                          | 5        | 36                   | 1        | 132                           | 15       | 1672                       | 187      |
| Division (2)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | 7                        | ...      | 42                          | 4        | 411                         | 39       | 677                         | 80       | 313                         | 36       | 134                         | 17       | 55                          | 5        | 36                   | 2        | 131                           | 20       | 1806                       | 203      |
|                                                              | 26                       | 4        | 290                         | 26       | 2220                        | 197      | 4045                        | 434      | 1898                        | 254      | 845                         | 128      | 399                         | 42       | 195                  | 18       | 871                           | 122      | 10789                      | 1225     |
|                                                              | 28                       | ...      | 314                         | ...      | 2415                        | ...      | 4401                        | ...      | 2065                        | ...      | 920                         | ...      | 434                         | ...      | 212                  | ...      | ...                           | ...      | ...                        | ...      |
|                                                              | 13                       | 3        | 106                         | 2        | 573                         | 30       | 527                         | 30       | 113                         | 4        | 38                          | ...      | 10                          | 2        | 4                    | ...      | 5                             | ...      | 1389                       | 71       |
|                                                              | 8                        | ...      | 75                          | 7        | 545                         | 24       | 477                         | 26       | 124                         | 8        | 27                          | 3        | 17                          | ...      | 7                    | ...      | 6                             | ...      | 1286                       | 68       |
| Division (3)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | 16                       | ...      | 71                          | 2        | 478                         | 28       | 482                         | 23       | 124                         | 12       | 40                          | 3        | 8                           | 2        | 5                    | 2        | 14                            | ...      | 1238                       | 72       |
|                                                              | 8                        | 3        | 107                         | 3        | 529                         | 28       | 502                         | 22       | 134                         | 7        | 29                          | 5        | 11                          | 2        | 3                    | 1        | 6                             | ...      | 1329                       | 71       |
|                                                              | 16                       | ...      | 145                         | 12       | 629                         | 30       | 485                         | 19       | 122                         | 13       | 39                          | 4        | 8                           | 2        | 8                    | ...      | 6                             | ...      | 1458                       | 80       |
|                                                              | 16                       | 2        | 103                         | 5        | 499                         | 34       | 516                         | 29       | 139                         | 6        | 40                          | 5        | 18                          | 2        | 11                   | 1        | 6                             | ...      | 1348                       | 84       |
|                                                              | 77                       | 8        | 607                         | 31       | 3253                        | 174      | 2989                        | 149      | 756                         | 50       | 213                         | 20       | 72                          | 10       | 38                   | 4        | 43                            | ...      | 8048                       | 446      |
| Corrected Total                                              | 78                       | ...      | 610                         | ...      | 3270                        | ...      | 3005                        | ...      | 760                         | ...      | 214                         | ...      | 73                          | ...      | 38                   | ...      | ...                           | ...      | ...                        | ...      |
| Division (3)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | 310                      | 55       | 1699                        | 288      | 4203                        | 775      | 4019                        | 930      | 1822                        | 505      | 870                         | 245      | 392                         | 129      | 179                  | 48       | 114                           | 24       | 13608                      | 2999     |
|                                                              | 277                      | 50       | 1542                        | 277      | 4009                        | 771      | 3737                        | 934      | 1634                        | 433      | 764                         | 272      | 373                         | 124      | 140                  | 45       | 78                            | 18       | 12554                      | 2924     |
|                                                              | 312                      | 51       | 1570                        | 296      | 3970                        | 884      | 3833                        | 983      | 1735                        | 515      | 781                         | 297      | 399                         | 147      | 181                  | 44       | 141                           | 28       | 12922                      | 3245     |
|                                                              | 289                      | 51       | 1777                        | 317      | 4617                        | 1034     | 4587                        | 1137     | 2108                        | 560      | 985                         | 302      | 477                         | 153      | 236                  | 69       | 155                           | 30       | 15231                      | 3653     |
|                                                              | 292                      | 49       | 1709                        | 338      | 4350                        | 1045     | 4449                        | 1105     | 2110                        | 549      | 949                         | 342      | 433                         | 128      | 223                  | 71       | 113                           | 23       | 14628                      | 3650     |
| Division (3)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | 335                      | 56       | 1878                        | 385      | 4354                        | 1144     | 4450                        | 1228     | 2229                        | 630      | 1024                        | 359      | 480                         | 168      | 222                  | 74       | 180                           | 47       | 15152                      | 4091     |
|                                                              | 1815                     | 312      | 10175                       | 1901     | 25503                       | 5653     | 25075                       | 6317     | 11638                       | 3192     | 5373                        | 1817     | 2554                        | 849      | 1181                 | 351      | 781                           | 170      | 84095                      | 20562    |
|                                                              | 1832                     | ...      | 10271                       | ...      | 25742                       | ...      | 25310                       | ...      | 11747                       | ...      | 5423                        | ...      | 2578                        | ...      | 1192                 | ...      | ...                           | ...      | ...                        | ...      |
|                                                              | 1832                     | ...      | 10271                       | ...      | 25742                       | ...      | 25310                       | ...      | 11747                       | ...      | 5423                        | ...      | 2578                        | ...      | 1192                 | ...      | ...                           | ...      | ...                        | ...      |
|                                                              | 1832                     | ...      | 10271                       | ...      | 25742                       | ...      | 25310                       | ...      | 11747                       | ...      | 5423                        | ...      | 2578                        | ...      | 1192                 | ...      | ...                           | ...      | ...                        | ...      |

\* The Corrected Total represents, in every case, the number of Male Criminals at each Term, provided the age of every Criminal had been ascertained and is obtained by the formula given on page 2.



| Division of Offences.                                        | Aged 12 years and under. |          | Aged 16 years and above 12. |          | Aged 21 years and above 16. |          | Aged 30 years and above 21. |          | Aged 40 years and above 30. |          | Aged 50 years and above 40. |          | Aged 60 years and above 50. |          | Aged above 60 years. |          | Age could not be ascertained. |          | Total Number of Offenders. |          |
|--------------------------------------------------------------|--------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|-----------------------------|----------|----------------------|----------|-------------------------------|----------|----------------------------|----------|
|                                                              | Males.                   | Females. | Males.                      | Females. | Males.                      | Females. | Males.                      | Females. | Males.                      | Females. | Males.                      | Females. | Males.                      | Females. | Males.               | Females. | Males.                        | Females. | Males.                     | Females. |
| Division (4)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | 3                        | ...      | 5                           | 4        | 36                          | 2        | 56                          | 2        | 21                          | ...      | 15                          | 2        | 8                           | 1        | 3                    | 1        | ...                           | ...      | 150                        | 12       |
|                                                              | 4                        | ...      | 5                           | 3        | 38                          | 1        | 51                          | 7        | 21                          | 1        | 10                          | 4        | 3                           | ...      | 7                    | ...      | ...                           | ...      | 140                        | 16       |
|                                                              | 2                        | ...      | 11                          | 6        | 33                          | 1        | 52                          | 2        | 25                          | ...      | 15                          | 1        | 8                           | 1        | 2                    | ...      | ...                           | ...      | 156                        | 12       |
|                                                              | 1                        | ...      | 9                           | 3        | 20                          | 5        | 40                          | 1        | 13                          | 2        | 10                          | 1        | 4                           | ...      | ...                  | ...      | ...                           | ...      | 102                        | 12       |
|                                                              | 1                        | ...      | 8                           | 1        | 18                          | 4        | 26                          | 2        | 7                           | 3        | 13                          | ...      | 4                           | ...      | 1                    | ...      | ...                           | ...      | 79                         | 10       |
| Division (5)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | 3                        | 1        | 3                           | 2        | 34                          | 1        | 23                          | 4        | 16                          | 1        | 8                           | 1        | 6                           | ...      | 1                    | ...      | ...                           | ...      | 95                         | 10       |
|                                                              | 14                       | 1        | 41                          | 19       | 179                         | 14       | 248                         | 18       | 103                         | 7        | 71                          | 9        | 33                          | 2        | 14                   | 2        | ...                           | ...      | 722                        | 72       |
|                                                              | 14                       | ...      | 42                          | ...      | 184                         | ...      | 255                         | ...      | 105                         | ...      | 73                          | ...      | 34                          | ...      | 15                   | ...      | ...                           | ...      | ...                        | ...      |
|                                                              | 2                        | 2        | 11                          | 7        | 72                          | 33       | 116                         | 37       | 52                          | 22       | 30                          | 15       | 12                          | 7        | 5                    | 5        | ...                           | ...      | 301                        | 130      |
|                                                              | 1                        | ...      | 7                           | 8        | 79                          | 30       | 109                         | 27       | 50                          | 7        | 20                          | 6        | 6                           | ...      | 6                    | 4        | ...                           | ...      | 279                        | 89       |
| Division (6)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | ...                      | ...      | 2                           | 3        | 96                          | 17       | 109                         | 25       | 48                          | 12       | 24                          | 6        | 2                           | 8        | 4                    | 2        | ...                           | ...      | 285                        | 74       |
|                                                              | 1                        | 1        | 16                          | 8        | 89                          | 16       | 123                         | 48       | 67                          | 20       | 26                          | 12       | 9                           | 7        | 6                    | 7        | ...                           | ...      | 337                        | 119      |
|                                                              | 3                        | ...      | 9                           | 4        | 102                         | 30       | 136                         | 38       | 73                          | 27       | 35                          | 9        | 18                          | 5        | 10                   | 3        | ...                           | ...      | 387                        | 116      |
|                                                              | ...                      | 2        | 16                          | 2        | 80                          | 25       | 127                         | 36       | 56                          | 20       | 32                          | 13       | 7                           | 6        | 9                    | 3        | ...                           | ...      | 329                        | 107      |
|                                                              | 7                        | 5        | 61                          | 32       | 518                         | 151      | 720                         | 211      | 346                         | 108      | 167                         | 61       | 54                          | 40       | 40                   | 24       | 5                             | 3        | 1918                       | 635      |
| Corrected Total                                              | 7                        | ...      | 62                          | ...      | 519                         | ...      | 721                         | ...      | 347                         | ...      | 168                         | ...      | 54                          | ...      | 40                   | ...      | ...                           | ...      | ...                        | ...      |
| Division (6)<br>1834<br>1835<br>1836<br>1837<br>1838<br>1839 | 4                        | ...      | 26                          | 1        | 248                         | 7        | 420                         | 46       | 183                         | 39       | 93                          | 19       | 33                          | 2        | 13                   | ...      | ...                           | ...      | 1208                       | 128      |
|                                                              | 2                        | ...      | 21                          | ...      | 247                         | 23       | 480                         | 34       | 190                         | 29       | 72                          | 16       | 42                          | 16       | 28                   | 4        | ...                           | ...      | 1226                       | 133      |
|                                                              | 1                        | ...      | 9                           | 1        | 182                         | 14       | 313                         | 37       | 162                         | 45       | 74                          | 12       | 34                          | 14       | 12                   | 3        | ...                           | ...      | 888                        | 136      |
|                                                              | 2                        | ...      | 19                          | ...      | 218                         | 17       | 310                         | 48       | 155                         | 49       | 51                          | 23       | 23                          | 11       | 14                   | 1        | ...                           | ...      | 870                        | 169      |
|                                                              | ...                      | ...      | 16                          | 2        | 124                         | 20       | 224                         | 39       | 120                         | 44       | 49                          | 26       | 25                          | 6        | 11                   | 2        | ...                           | ...      | 681                        | 146      |
| Totals                                                       | 2                        | ...      | 20                          | 4        | 224                         | 16       | 391                         | 44       | 182                         | 23       | 62                          | 7        | 46                          | 4        | 19                   | 1        | ...                           | ...      | 1101                       | 117      |
|                                                              | 11                       | ...      | 111                         | 8        | 1243                        | 97       | 2138                        | 248      | 992                         | 229      | 401                         | 103      | 203                         | 53       | 97                   | 11       | 778                           | 80       | 5974                       | 829      |
|                                                              | 13                       | ...      | 128                         | ...      | 1429                        | ...      | 2458                        | ...      | 1140                        | ...      | 461                         | ...      | 233                         | ...      | 112                  | ...      | ...                           | ...      | ...                        | ...      |
|                                                              | 337                      | 63       | 1899                        | 305      | 5598                        | 875      | 5942                        | 1127     | 2537                        | 609      | 1221                        | 304      | 535                         | 151      | 247                  | 56       | 564                           | 81       | 1880                       | 3571     |
|                                                              | 295                      | 51       | 1707                        | 303      | 5257                        | 890      | 5524                        | 1093     | 2371                        | 533      | 1042                        | 327      | 514                         | 159      | 212                  | 57       | 353                           | 43       | 17275                      | 3456     |
| Grand Total                                                  | 335                      | 51       | 1722                        | 315      | 5123                        | 969      | 5458                        | 1134     | 2399                        | 628      | 1070                        | 349      | 522                         | 178      | 235                  | 58       | 384                           | 54       | 17248                      | 3736     |
|                                                              | 303                      | 55       | 1962                        | 334      | 5774                        | 1128     | 6172                        | 1322     | 2758                        | 681      | 1211                        | 360      | 587                         | 177      | 284                  | 81       | 356                           | 67       | 19407                      | 4205     |
|                                                              | 317                      | 49       | 1933                        | 358      | 5562                        | 1165     | 5935                        | 1280     | 2733                        | 673      | 1226                        | 396      | 545                         | 146      | 289                  | 77       | 365                           | 45       | 18905                      | 4189     |
|                                                              | 363                      | 61       | 2062                        | 402      | 5602                        | 1259     | 6184                        | 1421     | 2935                        | 716      | 1300                        | 402      | 612                         | 185      | 298                  | 81       | 475                           | 85       | 19831                      | 4612     |
|                                                              | 1950                     | 330      | 11285                       | 2017     | 32916                       | 6286     | 35215                       | 7377     | 15733                       | 3840     | 7070                        | 2138     | 3315                        | 996      | 1565                 | 410      | 2497                          | 375      | 111546                     | 23769    |
| Cor. Grand Total                                             | 1995                     | ...      | 11543                       | ...      | 33670                       | ...      | 36021                       | ...      | 16093                       | ...      | 7232                        | ...      | 3391                        | ...      | 1601                 | ...      | ...                           | ...      | ...                        | ...      |



TABLE XXX.—*Criminal Offenders in England and Wales during the years 1834, 5, 6, 7, 8, and 9, in each Class of Offences, with the Ratio of Crime to the Population at the various Terms of Life, calculated to the corrected Population for the respective periods.*—MALES.

| Ages.                       |      | Population<br>in the Years<br>1834, 5, 6, 7, 8, and 9. |       | Criminals for those Years in each class of Offences. |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|-----------------------------|------|--------------------------------------------------------|-------|------------------------------------------------------|-----------|-----------------------------------------------------|-----------|---------------------------------------------------|-----------|-----------------------------------------------|-----------|-----------------------------------------------------|-----------|-------------------------------------------------------------|-----------|--------------------------|-----------|
|                             |      |                                                        |       | Offences against<br>the Person.                      |           | Offences<br>against Pro-<br>perty with<br>violence. |           | Offences against<br>Property without<br>violence. |           | Malicious<br>Offences<br>against<br>Property. |           | Forgery and<br>Offences<br>against the<br>Currency. |           | Other Offences,<br>not included<br>in the above<br>classes. |           | Total<br>of all classes. |           |
|                             |      |                                                        |       | (1)                                                  |           | (2)                                                 |           | (3)                                               |           | (4)                                           |           | (5)                                                 |           | (6)                                                         |           |                          |           |
|                             |      |                                                        |       | No.                                                  | Per cent. | No.                                                 | Per cent. | No.                                               | Per cent. | No.                                           | Per cent. | No.                                                 | Per cent. | No.                                                         | Per cent. | No.                      | Per cent. |
| Under 5                     | 1834 | 993160                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 1000810                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 1008538                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 1016316                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 1024154                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 1032053                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 6075040                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
| 5 to 10                     | 1834 | 891641                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 900163                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 908767                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 917453                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 926222                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 935075                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 5479321                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
| 10 to 15.                   | 1834 | 806642                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 816795                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 827077                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 837488                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 848030                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 858704                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 4994736                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
| 12 years<br>and<br>under    | 1834 | 2368786                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 2391059                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 2413551                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 2436262                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 2459194                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 2482350                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 14551202                                               | 28    | 00019                                                | 78        | 00053                                               | 1832      | 01259                                             | 14        | 00009                                         | 7         | 00004                                               | 13        | 00008                                                       | 1995      | 01371                    |           |
| 16 years<br>and<br>above 12 | 1834 | 624731                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 632953                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 641285                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 649727                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 658280                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 666946                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 3873922                                                | 314   | 00811                                                | 610       | 01574                                               | 10271     | 26513                                             | 42        | 00108                                         | 62        | 00160                                               | 128       | 00330                                                       | 11543     | 29797                    |           |
| 21 years<br>and<br>above 16 | 1834 | 687044                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 698331                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 709808                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 721479                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 733348                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 745417                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 4295427                                                | 2415  | 05622                                                | 3270      | 07613                                               | 25742     | 59929                                             | 184       | 00428                                         | 519       | 01208                                               | 1429      | 03326                                                       | 33670     | 78386                    |           |
| 30 years<br>and<br>above 21 | 1834 | 1020024                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 1042765                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 1066014                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 1089781                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 1114076                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 1138915                                                |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 6471575                                                | 4401  | 06800                                                | 3005      | 04643                                               | 25310     | 39109                                             | 255       | 00394                                         | 721       | 01114                                               | 2458      | 03798                                                       | 36021     | 55660                    |           |
| 40 years<br>and<br>above 30 | 1834 | 871464                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 888800                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 906480                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 924512                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 942902                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 961660                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 5495818                                                | 2065  | 03757                                                | 760       | 01383                                               | 11747     | 21374                                             | 102       | 00191                                         | 347       | 00631                                               | 1140      | 02074                                                       | 16093     | 29282                    |           |
| 50 years<br>and<br>above 40 | 1834 | 671533                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 682123                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 692879                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 703805                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 714904                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 726177                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 4191421                                                | 920   | 02195                                                | 214       | 00310                                               | 5423      | 12938                                             | 73        | 00174                                         | 168       | 00401                                               | 461       | 01099                                                       | 7232      | 17254                    |           |
| 60 years<br>and<br>above 50 | 1834 | 455946                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 461580                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 467284                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 473058                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 478904                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 484821                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 2821593                                                | 434   | 01538                                                | 73        | 00258                                               | 2578      | 09136                                             | 34        | 00123                                         | 54        | 00191                                               | 233       | 00825                                                       | 3391      | 12018                    |           |
| Above 60<br>years           | 1834 | 494796                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1835 | 500187                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1836 | 505636                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1837 | 511145                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1838 | 516714                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             | 1839 | 522344                                                 |       |                                                      |           |                                                     |           |                                                   |           |                                               |           |                                                     |           |                                                             |           |                          |           |
|                             |      | 3050822                                                | 212   | 00695                                                | 38        | 00124                                               | 1192      | 03908                                             | 15        | 00049                                         | 40        | 00131                                               | 112       | 00367                                                       | 1601      | 05248                    |           |
| Grand Total                 |      | 44751780                                               | 10789 | 02411                                                | 3048      | 01798                                               | 84095     | 18791                                             | 722       | 00161                                         | 1918      | 00429                                               | 5974      | 01335                                                       | 111546    | 24925                    |           |



It was not known at the time of writing this paragraph, that the Home Office had actually furnished the information required, respecting the ages of the persons committed for each class of crime, up till the year 1839; and that in subsequent years the returns have been presented in their present defective state. What could be the reasons for relinquishing their earlier plans, it is difficult to imagine. All the criminal returns for the six years 1834–1839, have been analysed, as shewn in Tables XXIX and XXX preceding for each class of crimes, and the population calculated by the formula given in pp. 2–3 *ante* for each year, and for each term of life, in order to discover the tendency at various ages to particular classes of crime.

These Tables explain themselves, being on precisely the same model as Tables I and II, only that Table XXX, instead of shewing the tendency to crime in the aggregate at each age, points out the tendency to particular classes or kinds of crime.

The following Abstract presents the general results arrived at:—

*Ratio per cent. of Criminals to the Population, yearly, at various terms of life, in each class of offences.*

| AGE.                  | Division.<br>(1) | Division<br>(2) | Division<br>(3) | Division<br>(4) | Division<br>(5) | Division<br>(6) |
|-----------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 years and under .  | ·00019           | ·00053          | ·01259          | ·00009          | ·00004          | ·00008          |
| 16 years and above 12 | ·00811           | ·01574          | ·26513          | ·00108          | ·00160          | ·00330          |
| 21 ... 16             | ·05622           | ·07613          | ·59929          | ·00428          | ·01208          | ·03326          |
| 30 ... 21             | ·06800           | ·04643          | ·39109          | ·00394          | ·01114          | ·03798          |
| 40 ... 30             | ·03757           | ·01383          | ·21374          | ·00191          | ·00631          | ·02074          |
| 50 ... 40             | ·02195           | ·00510          | ·12938          | ·00174          | ·00401          | ·01099          |
| 60 ... 50             | ·01538           | ·00258          | ·09136          | ·00123          | ·00191          | ·00825          |
| Above 60 years . .    | ·00695           | ·00124          | ·03908          | ·00049          | ·00131          | ·00367          |
| Total . . . .         | ·02411           | ·01798          | ·18791          | ·00161          | ·00429          | ·01335          |

*Number of the Population at various terms of life by which One Crime in each particular class of offences is committed yearly.*

| AGE.                  | Division<br>(1) | Division<br>(2) | Division<br>(3) | Division<br>(4) | Division<br>(5) | Division<br>(6) |
|-----------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| 12 years and under .  | 526315·79       | 188679·25       | 7942·81         | 1111111·11      | 2500000·00      | 1250000·00      |
| 16 years and above 12 | 12330·46        | 6353·24         | 377·22          | 92592·59        | 62500·00        | 30120·48        |
| 21 ... 16             | 1778·73         | 1313·54         | 166·86          | 23364·49        | 8278·15         | 3006·61         |
| 30 ... 21             | 1470·59         | 2153·78         | 255·69          | 25380·71        | 8976·66         | 2632·96         |
| 40 ... 30             | 2661·70         | 7230·66         | 467·95          | 52356·02        | 15847·86        | 4821·60         |
| 50 ... 40             | 4555·81         | 19607·84        | 772·80          | 57471·26        | 24937·66        | 9099·18         |
| 60 ... 50             | 6501·95         | 38759·69        | 1094·57         | 81300·81        | 52356·02        | 12121·21        |
| Above 60 years . .    | 14388·49        | 80645·16        | 2558·85         | 204081·63       | 76335·88        | 27247·96        |
| Total. . . .          | 4147·66         | 5561·73         | 532·20          | 62111·80        | 23310·02        | 7490·64         |

It will be recollected that when, on a former occasion, crime was viewed in the aggregate, the tendency to crime at various terms of life was shewn to follow a very remarkable law. From the age of 20 it was found that the tendency to crime in the male sex decreases at the rate of 33·333 per cent. for each term of life given in the Tables; but,



as anticipated, it will now be found that age becomes of still more importance in the investigation, when considering specific forms of crime. Some striking examples of this will be seen by referring to the preceding Abstract, and comparing the results in the different classes at ages "21 years and above 16," with the following terms of life, in which the tendency to crime is

In the class (1) of offences against the person at ages

|                                |        |
|--------------------------------|--------|
| 21 years and above 16.....     | ·05622 |
| 30     ...     ...     21..... | ·06800 |

Difference = ·01178 or + 20·95 per cent.

Again, in class (2), offences against property, with violence, at ages

|                                |        |
|--------------------------------|--------|
| 21 years and above 16.....     | ·07613 |
| 30     ...     ...     21..... | ·04643 |

Difference = ·02970 or - 39·01 per cent.

In class (3), offences against property, without violence, at ages

|                                |        |
|--------------------------------|--------|
| 21 years and above 16.....     | ·59929 |
| 30     ...     ...     21..... | ·39109 |

Difference = ·20820 or - 34·89 per cent.

In class (4), malicious offences against property

|                                |        |
|--------------------------------|--------|
| 21 years and above 16.....     | ·00428 |
| 30     ...     ...     21..... | ·00394 |

Difference = ·00034 or - 7·94 per cent.

In class (5), forgery and other offences against the currency

|                                |        |
|--------------------------------|--------|
| 21 years and above 16.....     | ·01208 |
| 30     ...     ...     21..... | ·01114 |

Difference = ·00094 or - 7·77 per cent.

It is, therefore, obvious, that the law which regulates the tendency to crime at different ages is not the same in every class. For, while in the class of offences against the person, there is an increased tendency at "30-21" of 20·95 per cent. above that shewn in the preceding term of life, there is in all the other classes a less tendency, varying from 39·01 per cent. in offences against property with violence, to only 7·77 per cent. in cases of forgery and other offences against the currency. At other ages, like differences will be found. The difference between the tendency to crime in class (2) at ages 40-30 and 50 40 is, 63·12 per cent., but the difference at the same age in class (4) is only 8·90 per cent.



The importance to criminal jurisprudence of a solution of this problem must be evident. No preventive measures can possibly be adopted till the knowledge exists of the particular tendencies to certain propensities and forms of crime at different ages. With a clear knowledge of these, however, the chances of success in averting crime must be greater, as the means are furnished of knowing in what particular sections of the community the strongest tendency exists to specific forms of crime.

On reflection, it will now be seen, with still greater force than formerly, that a necessity exists for a very refined analysis in investigations on crime, before drawing any conclusions. The importance of determining the ratio of crime at the different terms of life, in order to know the relative amount of crime in different districts, as well as to understand whether crime be on the increase or decrease, has already been shewn. It also appears equally important to determine the tendency at the respective ages to the specific forms of crime, otherwise the perturbations of which the various classes are susceptible may vitiate conclusions based on any evidence resting on mere general averages.

In the final column of Table XXX, will be found the expression for the tendency to crime in the aggregate of those six classes during the years 1834-1839. In this Table a peculiarity will be observed in the division of ages, but the population has been determined for the same ages by the methods already pointed out. The present division of ages commenced only with the reports for the year 1842. It will be found that above 20 years of age the amount of crime was less in the years 1834-1839 than in the period 1842-1844, and the following Abstract will shew the relative amount and tendency to crime at the two periods referred to.

| AGE.                 | Ratio per cent. of Criminals in |         | Excess per cent.<br>of Crime in 1842-4.<br>above 1834-9. |
|----------------------|---------------------------------|---------|----------------------------------------------------------|
|                      | 1842-4.                         | 1834-9. |                                                          |
| 15 to 20 . . . . .   | ·6841                           | ·7839   | — 14·588                                                 |
| 20 ... 30 . . . . .  | ·6952                           | ·5566   | + 19·937                                                 |
| 30 ... 40 . . . . .  | ·3794                           | ·2928   | + 22·825                                                 |
| 40 ... 50 . . . . .  | ·2505                           | ·1725   | + 31·110                                                 |
| 50 ... 60 . . . . .  | ·1694                           | ·1202   | + 29·044                                                 |
| 60 and upwards . . . | ·0813                           | ·0525   | + 35·424                                                 |

From the preceding Abstract it will be seen, that from 20 to 60 years of age, there has been an excess of crime in the period 1842-1844 over that of 1834-1839, varying at the different ages within that term of life from about 20 to 31 per cent.; and it will be found, on referring to page 327, that the tendency to crime in the intermediate period of years 1840-1841 was something like a mean between the results given in the preceding Abstract, thus pointing to a gradual increase in the criminal calendar of the country within



those periods; but on examination of Tables XXII and XXIII, and also of the Abstracts on page 327 it will be found that a marked reaction, particularly in the male sex, took place in the years 1845-48. One striking feature in the preceding Abstract is the fact, that while above 20 years of age there has been an increased ratio of crime within the period of 1842-44, there has been at the period of life, 15-20, a decrease of crime amounting to 14·588 per cent.; and on referring to the Second Abstract on page 327, a further diminution of crime at the same period of life to the extent of 6·388 per cent. will be found. This is contrary to the popular opinion held on the subject; but the preceding part of this paper also shewed that all the facts of the case went to prove that there was no increase of juvenile crime, and that if any change or movement be discovered in the criminal returns of any particular district, that change will be found to be promoted, not so much by fluctuations at the terms of life 10-15 and 15-20, as by the increase or decrease among those persons of more advanced ages. It is thus evident that over a period of fifteen years, ending December 1848, instead of there being an increase, there has been a positive decrease of crime among the population at the younger ages.

From the following Abstract it will be seen that the great amount of crime is due to one class (3) of offences—that which includes “offences against property committed without violence.”

| AGE.                 | Aggregate Crime during 1834-9. | Class 3 during 1834-9. | Per centage of Crime due to Class 3. |
|----------------------|--------------------------------|------------------------|--------------------------------------|
| 12 years and under . | ·01371                         | ·01259                 | 91·831                               |
| 12 to 16 . . . . .   | ·29770                         | ·26513                 | 88·979                               |
| 16 ... 21 . . . . .  | ·78386                         | ·59929                 | 76·453                               |
| 21 ... 30 . . . . .  | ·55660                         | ·39109                 | 70·264                               |
| 30 ... 40 . . . . .  | ·29282                         | ·21374                 | 72·994                               |
| 40 ... 50 . . . . .  | ·17254                         | ·12938                 | 74·985                               |
| 50 ... 60 . . . . .  | ·12018                         | ·09136                 | 76·020                               |
| 60 and upwards . . . | ·05242                         | ·03908                 | 74·467                               |

This Abstract at once points out the necessity for remedial measures being applied to the removal of this class of offences, which constitutes about three-fourths of all the crime in the country committed during maturer life. It will be further seen that nine-tenths of the whole amount of crime, by those of 16 years of age and under, is included in the same class; and, on reflection, it must appear evident, that very simple measures may, without difficulty, be employed by the legislature for the removal of the causes, or at least for the prevention of the great bulk of these offences.

Although this contribution has already extended to considerable length, every one giving attention to the many curious and most instructive results which have been arrived at on the question which, perhaps above all others, bears most directly on the



present and future happiness of the great mass of the people, will regret to find that any further useful inquiry and investigation into the progress of crime in this country must cease and determine with the close of the year 1848; and the cause of this cannot fail to evoke the strongest disapprobation of every one possessing the least philanthropy and sympathy for the moral and social condition of his countrymen; in fact, ever since the year 1839, the Home Office Returns have been periodically undergoing such changes, and have been from time to time presented to the public in so imperfect a shape and form, that at last they have become next to useless, and are now, not only wholly unavailable as aids in any correct inquiry into the state and progress of crime in this country, but are positively dangerous in the hands of mere cursory observers, and eminently calculated to lead them to the most fallacious and destructive conclusions. I should not therefore venture to dwell on any of the statements set forth in those Returns subsequent to the year 1848, were it not to place on record the startling fact, that while, not only in this country but throughout the whole civilised world, greater attention is year after year given to the development of improved statistical methods, in all matters which are likely to affect the moral and material progress of a people, or are even calculated to throw light on questions of merely a curious and speculative character, our Home Office Returns of Criminal Offenders have, for the last fifteen years, been barbarously retrogressive, and are, at present, in such a state as to be discreditable to the Government, and unworthy of a country laying so great pretensions to the promotion of economic and statistical science.

On referring to the facts recorded in Table XXVIII, preceding, and likewise to the Abstracts in pp. 389-90, it will be found that during the four years, 1836-9, the degree of instruction amongst criminals was not only given in the aggregate, but for the criminals in each division or class of offences. It has already been shewn how important it is to distinguish between the conditions and circumstances under which different kinds of crime are committed; but so far as education, or rather instruction, is concerned, this has been quite impossible ever since the year 1839. Again,

In the years 1834-39, as will be found, on referring to Tables XXIX and XXX, and likewise to the Abstracts of them in p. 395, that for that period of six years the ages of criminals were distinguished for each class of offences. Since the latter-mentioned year no such distinction has been observed in the published returns, and, consequently, ever since 1839 the curious, interesting, and instructive results disclosed in pp. 387-96 have remained completely isolated, and no one can tell how far the conclusions arrived at from the experience of those six years are justified by the progress and development of crime during the last fifteen years.

Again: from the year 1840 the ages of criminal offenders were given, not only for the whole kingdom in the aggregate, but for each county, until the close of the year 1848. In 1842 a new classification of ages however took place: accordingly, Tables I and



XXIII, inclusive, of this contribution will be seen to be based on this arrangement of facts, and have permitted an investigation to be made into the progress of crime, but without distinction of the particular class of offences in connection with age. It is however to be regretted that from the year 1848 this has been quite impossible, the published returns not containing the necessary elements.

There is still another defect in the Home Office Returns which cannot be passed over in silence. It has already been shewn that up to the year 1839 the Educational condition of Criminals was given, not only in their aggregate capacity, but for each particular class of offences, and from that time until 1848 the educational condition was given for the aggregate of all offences, but since then it will be found that no mention has been made as to whether a single criminal was capable of reading or writing, or possessed any degree of education or instruction whatever.

It consequently follows:—

- (a). That since the year 1848, neither the age nor the educational condition of criminals has been given even for the aggregate of all classes of offences.
- (b). Since the year 1839, nothing is known of the age of criminals in connection with specific classes of offences. And
- (c). Since the year 1839, nothing is known of the educational condition of criminals committed under each class of offences.

These have been already shewn to be elements of vital importance in every inquiry into Criminal Statistics, and it is certainly surprising to find that, having been once recognised in the Home Office Returns, they should, in an age in which it is so well known statistical science is forcing itself on the consideration of Governmental Departments, be so systematically discarded. There is yet another change, of more recent date, to which it may be well to allude before concluding this subject.

On examination of the Home Office Returns, it will be found that, until the year 1851, they distinguished the numbers of males and females in each class of offenders in every County in England and Wales, without taking notice of the other important elements referred to in paragraphs (a), (b), and (c) immediately preceding; but since the year 1851, no distinction even of sex, has, under this meagre aspect of the question, been recognised by the authorities of the Home Office.

The following Tables, constructed from the published Returns for the years 1849-53 inclusive, are therefore only given by way of contrast, and as a practical illustration of the changes of which a Governmental Department is really capable of effecting at a time when the Governments of Europe and America are, by their Deputies, periodically assembling in Congress to improve and systematise the records of all facts and phenomena bearing on the happiness, prosperity, social progress, and moral and intellectual elevation of the people.



TABLE XXXI.

*Number of Criminals in each County during the Five Years 1849-53.*

| County.           | Offences<br>against the<br>Person. | Offences<br>against<br>Property<br>with<br>Violence. | Offences<br>against<br>Property<br>without<br>Violence. | Malicious<br>Offences<br>against<br>Property. | Forgery<br>and Offences<br>against the<br>Currency. | Other<br>Offences. | Total of the<br>Five Years,<br>1849-53. | Average<br>for each<br>Year. |
|-------------------|------------------------------------|------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------|--------------------|-----------------------------------------|------------------------------|
| Bedford .....     | 48                                 | 86                                                   | 692                                                     | 38                                            | 20                                                  | 12                 | 896                                     | 179                          |
| Berks.....        | 137                                | 102                                                  | 1376                                                    | 40                                            | 31                                                  | 53                 | 1739                                    | 348                          |
| Bucks .....       | 78                                 | 121                                                  | 1001                                                    | 30                                            | 27                                                  | 29                 | 1286                                    | 257                          |
| Cambridge .....   | 126                                | 90                                                   | 1241                                                    | 61                                            | 33                                                  | 12                 | 1563                                    | 313                          |
| Chester .....     | 393                                | 335                                                  | 3927                                                    | 44                                            | 108                                                 | 116                | 4923                                    | 985                          |
| Cornwall .....    | 124                                | 85                                                   | 888                                                     | 16                                            | 13                                                  | 36                 | 1162                                    | 232                          |
| Cumberland .....  | 76                                 | 44                                                   | 573                                                     | 2                                             | 12                                                  | 44                 | 751                                     | 150                          |
| Derby.....        | 149                                | 111                                                  | 859                                                     | 10                                            | 39                                                  | 66                 | 1234                                    | 247                          |
| Devon.....        | 279                                | 197                                                  | 3252                                                    | 70                                            | 59                                                  | 61                 | 3918                                    | 784                          |
| Dorset .....      | 81                                 | 80                                                   | 1011                                                    | 16                                            | 13                                                  | 44                 | 1245                                    | 249                          |
| Durham .....      | 140                                | 93                                                   | 1309                                                    | 14                                            | 77                                                  | 89                 | 1722                                    | 344                          |
| Essex.....        | 170                                | 292                                                  | 2368                                                    | 64                                            | 62                                                  | 54                 | 3010                                    | 602                          |
| Gloucester .....  | 349                                | 317                                                  | 3928                                                    | 31                                            | 75                                                  | 150                | 4850                                    | 970                          |
| Hereford.....     | 67                                 | 127                                                  | 931                                                     | 11                                            | 16                                                  | 74                 | 1226                                    | 245                          |
| Herts .....       | 106                                | 102                                                  | 1176                                                    | 44                                            | 71                                                  | 32                 | 1531                                    | 306                          |
| Hunts.....        | 62                                 | 39                                                   | 339                                                     | 18                                            | 12                                                  | 10                 | 480                                     | 96                           |
| Kent .....        | 387                                | 329                                                  | 3856                                                    | 43                                            | 163                                                 | 137                | 4915                                    | 983                          |
| Lancaster .....   | 1151                               | 1398                                                 | 13088                                                   | 38                                            | 517                                                 | 491                | 16683                                   | 3337                         |
| Leicester.....    | 122                                | 84                                                   | 1142                                                    | 16                                            | 38                                                  | 57                 | 1459                                    | 292                          |
| Lincoln .....     | 209                                | 162                                                  | 2039                                                    | 53                                            | 42                                                  | 84                 | 2589                                    | 518                          |
| Middlesex .....   | 1435                               | 884                                                  | 14990                                                   | 40                                            | 1034                                                | 500                | 18883                                   | 3777                         |
| Monmouth.....     | 159                                | 160                                                  | 1501                                                    | 3                                             | 39                                                  | 39                 | 1901                                    | 380                          |
| Norfolk .....     | 233                                | 194                                                  | 2881                                                    | 68                                            | 40                                                  | 81                 | 3497                                    | 699                          |
| Northampton ..... | 103                                | 86                                                   | 1085                                                    | 25                                            | 16                                                  | 85                 | 1400                                    | 280                          |
| Northumberland .. | 127                                | 219                                                  | 932                                                     | 4                                             | 43                                                  | 53                 | 1378                                    | 276                          |
| Notts .....       | 133                                | 135                                                  | 1285                                                    | 17                                            | 32                                                  | 62                 | 1664                                    | 333                          |
| Oxford .....      | 120                                | 98                                                   | 1149                                                    | 35                                            | 24                                                  | 44                 | 1470                                    | 294                          |
| Rutland .....     | 17                                 | 14                                                   | 116                                                     | 8                                             | 1                                                   | 6                  | 162                                     | 32                           |
| Salop .....       | 114                                | 130                                                  | 1350                                                    | 10                                            | 19                                                  | 37                 | 1660                                    | 332                          |
| Somerset.....     | 281                                | 315                                                  | 2989                                                    | 43                                            | 43                                                  | 76                 | 3747                                    | 749                          |
| Southampton ..... | 215                                | 188                                                  | 2963                                                    | 57                                            | 71                                                  | 111                | 3605                                    | 721                          |
| Stafford .....    | 464                                | 367                                                  | 4086                                                    | 29                                            | 145                                                 | 158                | 5249                                    | 1050                         |
| Suffolk .....     | 185                                | 185                                                  | 2235                                                    | 65                                            | 33                                                  | 65                 | 2768                                    | 554                          |
| Surrey .....      | 415                                | 337                                                  | 4331                                                    | 29                                            | 301                                                 | 70                 | 5483                                    | 1097                         |
| Sussex .....      | 135                                | 175                                                  | 2010                                                    | 29                                            | 47                                                  | 86                 | 2482                                    | 496                          |
| Warwick.....      | 272                                | 419                                                  | 3420                                                    | 33                                            | 136                                                 | 67                 | 4347                                    | 869                          |
| Westmoreland .... | 12                                 | 20                                                   | 237                                                     | 5                                             | 6                                                   | 13                 | 293                                     | 59                           |
| Wilts .....       | 134                                | 119                                                  | 1670                                                    | 32                                            | 22                                                  | 23                 | 2000                                    | 400                          |
| Worcester .....   | 240                                | 255                                                  | 2336                                                    | 14                                            | 61                                                  | 49                 | 2955                                    | 591                          |
| York .....        | 834                                | 933                                                  | 7859                                                    | 85                                            | 270                                                 | 281                | 10262                                   | 2052                         |

The following is an Abstract of the preceding results, so far as the same is practicable, thrown into the same form as Tables XXVI and XXVII preceding.



TABLE XXXII.

*Abstract of the Criminal Returns for the Five Years 1849-53, so far as it has been possible to make the defective returns of those years available. From the explanatory remarks already furnished, it will be seen that no distinction of sex has been made, no return of ages is given; and therefore it has been impossible to apply the consequent corrections pointed out in the early part of this paper, as being so essential in every correct inquiry. No notice has been taken in the Home Office Returns for the same Five Years of the educational condition of offenders: and from these defects this and Table XXXI preceding cannot receive the same confidence as the other Tables of this contribution.*

| Groups of Counties.—Inferior Degree of Education in the General Community. |                                                                                                 |                                                                 |  | Population,<br>1851. | Average Crime<br>per Annum<br>during 1849-53. | Ratio per<br>cent.<br>at all ages. |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--|----------------------|-----------------------------------------------|------------------------------------|
| Least Agricultural . . . .                                                 | Group 1<br>sect. (a)                                                                            | Lancashire, Stafford, Monmouth, Ches-<br>ter, Warwick . . . . . |  | 3,728,108            | 6621                                          | ·178                               |
|                                                                            |                                                                                                 | Excluding Lancashire . . . . .                                  |  | 1,696,872            | 3284                                          | ·194                               |
| Greatest ... . . . .                                                       | Group 2<br>sect. (a)                                                                            | Bedford, Essex, Cambridge, Suffolk,<br>Hunts . . . . .          |  | 1,080,599            | 1744                                          | ·161                               |
| Greatest Manufacturing . .                                                 | Group 3<br>sect. (a)                                                                            | Stafford, Lancashire, Chester, Notts . .                        |  | 3,366,104            | 5705                                          | ·169                               |
|                                                                            |                                                                                                 | Excluding Lancashire . . . . .                                  |  | 1,334,868            | 2368                                          | ·177                               |
| Least ... . . . .                                                          | Group 4<br>sect. (a)                                                                            | Cambridge, Essex, Huntingdon, Rut-<br>land . . . . .            |  | 641,889              | 1043                                          | ·162                               |
| Manufacturing interest 33½<br>per cent. above the average                  | Group 5<br>sect. (a)                                                                            | Stafford, Chester, Lancashire, Notts,<br>Warwick . . . . .      |  | 3,841,117            | 6574                                          | ·171                               |
|                                                                            |                                                                                                 | Excluding Lancashire . . . . .                                  |  | 1,809,881            | 3237                                          | ·179                               |
| Agricultural interest 50 per<br>cent. above the average .                  | Group 6<br>sect. (a)                                                                            | Bedford, Suffolk, Cambridge, Essex,<br>Hunts, Wilts . . . . .   |  | 1,334,820            | 2144                                          | ·161                               |
| Manufacturing and Agricul-<br>tural interests nearly equal                 | Group 7<br>sect. (a)                                                                            | Hereford, Bedford, Norfolk, Salop . .                           |  | 912,022              | 1455                                          | ·159                               |
| Greatest wealth . . . . .                                                  | Group 8<br>sect. (a)                                                                            | Devonshire, Gloucestershire . . . .                             |  | 1,025,903            | 1754                                          | ·171                               |
| Least wealth . . . . .                                                     | Group 9<br>sect. (a)                                                                            | Monmouth, Bedford, Hunts, Stafford .                            |  | 954,795              | 1705                                          | ·179                               |
|                                                                            | Group in which those signing with "Marks" ex-<br>ceed the average by 33½ per cent. . . . .      |                                                                 |  | 1,682,241            | 3021                                          | ·180                               |
| Groups of Counties.—Higher Degree of Education in the General Community.   |                                                                                                 |                                                                 |  | Population,<br>1851. | Annual Crime<br>per Annum<br>during 1849-53.  | Ratio per<br>cent.<br>at all ages. |
| Least Agricultural . . . .                                                 | Group 1<br>sect. (b)                                                                            | Durham, Surrey, Northumberland,<br>Derby, Gloucester . . . . .  |  | 2,132,536            | 2934                                          | ·138                               |
| Greatest ... . . . .                                                       | Group 2<br>sect. (b)                                                                            | Bucks, Lincoln, Hereford, Rutland,<br>Berks, Wilts . . . . .    |  | 1,133,703            | 1800                                          | ·160                               |
| Greatest Manufacturing . .                                                 | Group 3<br>sect. (b)                                                                            | Middlesex, Derby, Leicester, Warwick .                          |  | 2,887,981            | 5185                                          | ·179                               |
|                                                                            |                                                                                                 | Excluding Middlesex . . . . .                                   |  | 1,001,405            | 1408                                          | ·141                               |
| Least ... . . . .                                                          | Group 4<br>sect. (b)                                                                            | Sussex, Lincoln, Hereford . . . . .                             |  | 859,555              | 1259                                          | ·146                               |
| Manufacturing interest 33½<br>per cent. above the average                  | Group 5<br>sect. (b)                                                                            | Middlesex, Surrey, Derby, Leicester .                           |  | 3,096,050            | 5413                                          | ·174                               |
|                                                                            |                                                                                                 | Excluding Middlesex . . . . .                                   |  | 1,209,474            | 1636                                          | ·135                               |
| Agricultural interest 50 per<br>cent. above the average .                  | Group 6<br>sect. (b)                                                                            | Bucks, Sussex, Lincoln, Hereford,<br>Rutland, Berks . . . . .   |  | 1,216,326            | 1896                                          | ·156                               |
| Manufacturing and Agricul-<br>tural interests nearly equal                 | Group 7<br>sect. (b)                                                                            | Dorset, Southampton, Northampton . .                            |  | 801,957              | 1250                                          | ·156                               |
| Greatest wealth . . . . .                                                  | Group 8<br>sect. (b)                                                                            | Cumberland, Surrey, Westmoreland . .                            |  | 936,861              | 1306                                          | ·139                               |
| Least wealth . . . . .                                                     | Group 9<br>sect. (b)                                                                            | Bucks, Derby, Notts, Northampton . .                            |  | 942,614              | 1117                                          | ·118                               |
|                                                                            | Groups in which those signing with "Marks" are<br>less than the average by 25 per cent. . . . . |                                                                 |  | 2,362,247            | 2967                                          | ·126                               |



TABLE XXXIII.

*Number of Criminals in each County during the Two Years 1854-5.*

| County.           | Offences<br>against the<br>Person. | Offences<br>against<br>Property<br>with<br>Violence. | Offences<br>against<br>Property<br>without<br>Violence. | Malicious<br>Offences<br>against<br>Property. | Forgery<br>and Offences<br>against the<br>Currency. | Other<br>Offences. | Total. | Average<br>for each<br>Year. |
|-------------------|------------------------------------|------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------|--------------------|--------|------------------------------|
| Bedford .....     | 16                                 | 29                                                   | 366                                                     | 10                                            | 5                                                   | 9                  | 435    | 218                          |
| Berks .....       | 38                                 | 28                                                   | 540                                                     | 17                                            | 25                                                  | 8                  | 656    | 328                          |
| Bucks.....        | 24                                 | 46                                                   | 458                                                     | 10                                            | 8                                                   | 7                  | 553    | 277                          |
| Cambridge .....   | 19                                 | 26                                                   | 438                                                     | 9                                             | 5                                                   | 7                  | 504    | 252                          |
| Chester .....     | 149                                | 130                                                  | 1608                                                    | 7                                             | 50                                                  | 30                 | 1974   | 987                          |
| Cornwall .....    | 49                                 | 32                                                   | 401                                                     | 5                                             | 11                                                  | 23                 | 521    | 261                          |
| Cumberland .....  | 31                                 | 17                                                   | 206                                                     | 3                                             | 6                                                   | 11                 | 274    | 137                          |
| Derby.....        | 81                                 | 61                                                   | 419                                                     | 7                                             | 28                                                  | 7                  | 603    | 302                          |
| Devon.....        | 80                                 | 62                                                   | 1257                                                    | 14                                            | 28                                                  | 64                 | 1505   | 753                          |
| Dorset .....      | 34                                 | 40                                                   | 528                                                     | 5                                             | 6                                                   | 14                 | 627    | 314                          |
| Durham .....      | 96                                 | 34                                                   | 614                                                     | 2                                             | 16                                                  | 18                 | 780    | 390                          |
| Essex .....       | 60                                 | 76                                                   | 993                                                     | 16                                            | 41                                                  | 17                 | 1203   | 602                          |
| Gloucester .....  | 85                                 | 89                                                   | 1669                                                    | 13                                            | 32                                                  | 3                  | 1891   | 946                          |
| Hereford .....    | 36                                 | 23                                                   | 370                                                     | 8                                             | 7                                                   | 5                  | 449    | 225                          |
| Herts.....        | 45                                 | 33                                                   | 584                                                     | 16                                            | 40                                                  | 19                 | 737    | 369                          |
| Hunts .....       | 20                                 | 7                                                    | 131                                                     | 15                                            | 2                                                   | ...                | 175    | 88                           |
| Kent .....        | 127                                | 100                                                  | 1739                                                    | 31                                            | 75                                                  | 39                 | 2111   | 1056                         |
| Lancaster .....   | 503                                | 553                                                  | 5179                                                    | 19                                            | 230                                                 | 121                | 6605   | 3303                         |
| Leicester .....   | 37                                 | 32                                                   | 536                                                     | 6                                             | 20                                                  | 33                 | 664    | 332                          |
| Lincoln .....     | 81                                 | 46                                                   | 651                                                     | 12                                            | 20                                                  | 23                 | 833    | 417                          |
| Middlesex .....   | 432                                | 387                                                  | 5997                                                    | 22                                            | 495                                                 | 115                | 7448   | 3724                         |
| Monmouth .....    | 64                                 | 42                                                   | 624                                                     | 5                                             | 13                                                  | 14                 | 762    | 381                          |
| Norfolk .....     | 86                                 | 57                                                   | 1161                                                    | 22                                            | 9                                                   | 36                 | 1371   | 686                          |
| Northampton ..... | 30                                 | 18                                                   | 488                                                     | 17                                            | 9                                                   | 27                 | 589    | 295                          |
| Northumberland .. | 66                                 | 107                                                  | 541                                                     | 13                                            | 25                                                  | 24                 | 776    | 388                          |
| Notts .....       | 116                                | 45                                                   | 587                                                     | 12                                            | 47                                                  | 25                 | 832    | 416                          |
| Oxford .....      | 33                                 | 32                                                   | 498                                                     | 5                                             | 11                                                  | 10                 | 589    | 295                          |
| Rutland .....     | 1                                  | 2                                                    | 39                                                      | 1                                             | ...                                                 | ...                | 43     | 22                           |
| Salop .....       | 49                                 | 40                                                   | 437                                                     | 6                                             | 17                                                  | 9                  | 558    | 279                          |
| Somerset .....    | 73                                 | 107                                                  | 1041                                                    | 14                                            | 28                                                  | 38                 | 1301   | 651                          |
| Southampton ..... | 84                                 | 104                                                  | 1246                                                    | 17                                            | 34                                                  | 20                 | 1505   | 753                          |
| Stafford .....    | 154                                | 160                                                  | 1742                                                    | 11                                            | 47                                                  | 53                 | 2167   | 1084                         |
| Suffolk .....     | 43                                 | 43                                                   | 851                                                     | 20                                            | 6                                                   | 18                 | 981    | 491                          |
| Surrey .....      | 155                                | 112                                                  | 1711                                                    | 16                                            | 199                                                 | 27                 | 2220   | 1110                         |
| Sussex .....      | 75                                 | 42                                                   | 855                                                     | 8                                             | 11                                                  | 28                 | 1019   | 510                          |
| Warwick.....      | 88                                 | 171                                                  | 1440                                                    | 9                                             | 96                                                  | 35                 | 1839   | 920                          |
| Westmoreland ...  | 4                                  | 4                                                    | 76                                                      | 1                                             | 3                                                   | 4                  | 92     | 46                           |
| Wilts .....       | 36                                 | 38                                                   | 624                                                     | 10                                            | 15                                                  | 8                  | 731    | 366                          |
| Worcester .....   | 85                                 | 104                                                  | 1024                                                    | 6                                             | 26                                                  | 23                 | 1268   | 634                          |
| York .....        | 287                                | 309                                                  | 3259                                                    | 23                                            | 104                                                 | 106                | 4088   | 2044                         |

The following is an Abstract of the preceding results, so far as the same is practicable, thrown into the same form as Tables XXVI, XXVII, and XXXI preceding.



TABLE XXXIV.

*Abstract of the Criminal Returns for the Two Years 1854-5, so far as it has been possible to make the defective returns of those years available. From the explanatory remarks already furnished, it will be seen that no distinction of sex has been made, no return of ages is given; and therefore it has been impossible to apply the consequent corrections pointed out in the early part of this paper, as being so essential in every correct inquiry. No notice has been taken in the Home Office Returns for the same Years of the educational condition of offenders: and from these defects this and Tables XXXI, XXXII, and XXXIII preceding cannot receive the same confidence as the other Tables of this contribution.*

| Group of Counties.—Inferior Degree of Education in the General Community. |                                                                                                   |                                                                   | Population,<br>1851. | Average Crime<br>per Annum<br>during 1854-5. | Ratio per<br>cent.<br>at all ages. |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|----------------------|----------------------------------------------|------------------------------------|
| Least Agricultural . . . .                                                | Group 1<br>sect. (a)                                                                              | Lancashire, Stafford, Monmouth, Ches-<br>ter, Warwick . . . . . } | 3,728,108            | 6675                                         | ·179                               |
|                                                                           |                                                                                                   | Excluding Lancashire . . . . . }                                  | 1,696,872            | 3372                                         | ·199                               |
| Greatest ... . . . .                                                      | Group 2<br>sect. (a)                                                                              | Bedford, Essex, Cambridge, Suffolk,<br>Hunts . . . . . }          | 1,080,599            | 1651                                         | ·153                               |
| Greatest Manufacturing . . .                                              | Group 3<br>sect. (a)                                                                              | Stafford, Lancashire, Chester, Notts . .                          | 3,366,104            | 5790                                         | ·172                               |
|                                                                           |                                                                                                   | Excluding Lancashire . . . . . }                                  | 1,334,868            | 2487                                         | ·186                               |
| Least ... . . . .                                                         | Group 4<br>sect. (a)                                                                              | Cambridge, Essex, Huntingdon, Rut-<br>land . . . . . }            | 641,889              | 964                                          | ·150                               |
| Manufacturing interest 33½<br>per cent. above the average                 | Group 5<br>sect. (a)                                                                              | Stafford, Chester, Lancashire, Notts,<br>Warwick . . . . . }      | 3,841,117            | 6710                                         | ·175                               |
|                                                                           |                                                                                                   | Excluding Lancashire . . . . . }                                  | 1,809,881            | 3407                                         | ·188                               |
| Agricultural interest 50 per<br>cent. above the average .                 | Group 6<br>sect. (a)                                                                              | Bedford, Suffolk, Cambridge, Essex,<br>Hunts, Wilts . . . . . }   | 1,334,820            | 2017                                         | ·151                               |
| Manufacturing and Agricul-<br>tural interests nearly equal                | Group 7<br>sect. (a)                                                                              | Hereford, Bedford, Norfolk, Salop . .                             | 912,022              | 1408                                         | ·154                               |
| Greatest wealth . . . . .                                                 | Group 8<br>sect. (a)                                                                              | Devonshire, Gloucestershire . . . . . }                           | 1,025,903            | 1699                                         | ·166                               |
| Least wealth . . . . .                                                    | Group 9<br>sect. (a)                                                                              | Monmouth, Bedford, Hunts, Stafford . .                            | 954,795              | 1771                                         | ·186                               |
|                                                                           | Group in which those signing with "Marks" ex-<br>ceed the average by 33½ per cent. . . . . }      |                                                                   | 1,682,241            | 3035                                         | ·180                               |
| Group of Counties.—Higher Degree of Education in the General Community.   |                                                                                                   |                                                                   | Population,<br>1851. | Average Crime<br>per Annum<br>during 1854-5. | Ratio per<br>cent.<br>at all ages. |
| Least Agricultural . . . .                                                | Group 1<br>sect. (b)                                                                              | Durham, Surrey, Northumberland,<br>Derby, Gloucester . . . . . }  | 2,132,536            | 3136                                         | ·147                               |
| Greatest ... . . . .                                                      | Group 2<br>sect. (b)                                                                              | Bucks, Lincoln, Hereford, Rutland,<br>Berks, Wilts . . . . . }    | 1,133,703            | 1635                                         | ·144                               |
| Greatest Manufacturing . . .                                              | Group 3<br>sect. (b)                                                                              | Middlesex, Derby, Leicester, Warwick .                            | 2,887,981            | 5278                                         | ·183                               |
|                                                                           |                                                                                                   | Excluding Middlesex . . . . . }                                   | 1,001,405            | 1554                                         | ·155                               |
| Least ... . . . .                                                         | Group 4<br>sect. (b)                                                                              | Sussex, Lincoln, Hereford . . . . . }                             | 859,555              | 1152                                         | ·134                               |
| Manufacturing interest 33½<br>per cent. above the average                 | Group 5<br>sect. (b)                                                                              | Middlesex, Surrey, Derby, Leicester . .                           | 3,096,050            | 5468                                         | ·177                               |
|                                                                           |                                                                                                   | Excluding Middlesex . . . . . }                                   | 1,209,474            | 1744                                         | ·144                               |
| Agricultural interest 50 per<br>cent. above the average .                 | Group 6<br>sect. (b)                                                                              | Bucks, Sussex, Lincoln, Hereford,<br>Rutland, Berks . . . . . }   | 1,216,326            | 1779                                         | ·146                               |
| Manufacturing and Agricul-<br>tural interests nearly equal                | Group 7<br>sect. (b)                                                                              | Dorset, Southampton, Northampton . .                              | 801,957              | 1362                                         | ·170                               |
| Greatest wealth . . . . .                                                 | Group 8<br>sect. (b)                                                                              | Cumberland, Surrey, Westmoreland . .                              | 936,861              | 1293                                         | ·138                               |
| Least wealth . . . . .                                                    | Group 9<br>sect. (b)                                                                              | Bucks, Derby, Notts, Northampton . .                              | 942,614              | 1290                                         | ·137                               |
|                                                                           | Groups in which those signing with "Marks" are<br>less than the average by 25 per cent. . . . . } |                                                                   | 2,362,247            | 3101                                         | ·131                               |



## RECAPITULATION.

The facts brought forward in this paper lead to the following conclusions:—

1. That the tendency to crime among the male population at various terms of life varies from  $\cdot7702$  per cent. at the term of life 20–25, to  $\cdot1694$  per cent. at ages 50–60, or, in other words, the tendency to crime at one period of life is more than quadruple that at another\*. Age appears to have a similar influence on the tendency to crime in the female sex.

2. That the tendency to crime in the male sex is nearly five times as great as in the female sex. Over the whole male population of England and Wales, at all ages, the tendency to crime is  $\cdot2978$  per cent., and for the female sex it is  $\cdot0633$  per cent.,—that is to say, one in every 336 of the male population is yearly guilty of a criminal offence, and in the female sex, one in every 1581†.

3. That in the various districts and counties of England and Wales there is a remarkable difference in the distribution of the population over the various terms of life. In the counties of Anglesea, Carmarthen, and Dorset, the proportion of the whole population alive at the quinquennial term of life, 20–25, is less than 8 per cent.; but in Lancaster, Middlesex, and Monmouth, the proportion varies from 10 to upwards of 11 per cent.: and at other periods of life like differences will be found‡.

4. It hence follows, that if even the tendency to crime were precisely the same at the respective terms of life in those districts, there would still be, in reference to the whole population, an apparent increase of crime in the last three counties, from the fact that they contain a greater proportion of their population at the term of life at which the tendency to crime is the greatest. This truth is established by the facts, that during the years 1842–3–4 the actual proportion of male criminals in England and Wales was 1 in 336 of the whole male population§; but if the population had been under the same distribution in regard to age as in the year 1821, the proportion of criminals would have been 1 in 365 only, and if under the same distribution as in the city of Glasgow, crime would appear as high as 1 in every 304||. Again, the difference of distribution of even two districts of the metropolis is such as to produce in Bethnal Green the proportion of 1 in 338, while in St. George's, Hanover Square, the ratio would be as high as 1 in 280¶; manifesting an error, in any method of inquiry neglecting the element of age, of about 21 per cent. An inspection of the results obtained in the early part of this paper will shew that a uniform tendency to crime in each county at the respective terms of life would, in consequence of the difference in the distribution of their populations according to age, produce in Anglesea, Cardigan, Carmarthen, Dorset, Merioneth, Montgomery, and

\* See Tables I and II, also Tables XXII and XXIII; and likewise the Abstracts in pp. 326–7, 398.

† See Tables I and II, also Tables XXII and XXIII. ‡ See Table V. § See Table I.

|| See Table VII.

¶ See Table VII.



Pembroke, the ratio of one crime yearly to every 360 of the population; but in Glamorgan, Lancaster, Middlesex, and Monmouth, the same tendency to crime would produce as high an average as from 1 in 325 to 1 in 313, being a difference of at least 18 per cent.\* It is, therefore, evident, that the element of age is an essential item in every inquiry or investigation into the relative amount and progress of crime in different districts; and on the same evidence the element of sex must appear equally important; and hence calculations in which those elements are neglected cannot be relied on as shewing the relative amount of crime in different districts, nor in the same districts at different periods of time: for here we have an apparent difference of crime in some districts to the extent of 20 per cent. above that in others, in which the same tendency to crime has been assumed to prevail, accounted for by the simple fact of a difference in the distribution of their population; and other differences of even greater extent are found to depend on the relative proportion of the sexes in the respective districts. Hence the great necessity in all such inquiries, of having recourse to those elements, in order to determine the relative amount of crime, and the danger of depending on any conclusions arrived at by any methods of inquiry in which they are neglected.

6. That every properly conducted inquiry into criminal statistics, intended to shew the relative tendencies to crime in different districts, or in the same district, at different periods, must distinguish the amount and degree of crime in each sex, and shew the amount and tendency to crime for each sex and at every term of life for given districts at the respective periods of time†.

7. That the tendency to crime at each successive term of life given in the Tables decreases from the age of 20 at the rate of 33·333 per cent. for the male sex, and at the rate of 25 per cent. for the female sex‡.

8. That in some counties or districts, crime is upwards of 50 per cent. above the average of the kingdom, while in others it is nearly 70 per cent. below the average§.

9. That in all the agricultural groups of counties there seems to be a remarkable uniformity in the tendency to crime, varying in an excess of crime above the average for the whole kingdom of 5·3 per cent. to 6·8 per cent.; but in the mining and manufacturing groups of counties, although the whole combined shew less than the average crime for England and Wales, still in one portion of the groups there is an excess of 33·5 per cent. of crime; while in another, crime is 52·1 per cent. below the average||; proving that there must be some powerful element in the social and moral state of the people, not eliminated in such combinations, producing this remarkable disparity.

10. That the usual test by which the manufacturing and agricultural counties are determined, may often be neutralized by a corresponding high or low ratio of agriculturists

\* See Table VII.

† See Tables I and II, also Tables XXII and XXIII.

‡ See Tables I and II, also Tables XXII and XXIII; and likewise Abstracts pp. 326-7.

§ See Table XI.

|| See Tables XII and XIII.



and manufacturers in each: but adopting corrections as in Tables XIV and XV, to avoid such errors, and testing the counties in which the most striking differences exist as to their agricultural and manufacturing conditions, it is found that the mere fact of such differences in the habits of the people has little or no influence on the increase or decrease of crime, and offers no solution to the problem of what is that element or feature which produces in one great community an excess of 52·1 per cent. of crime, and in another community reduces crime 33·5 per cent. below the average\*.

11. That by adopting the test of education or instruction furnished by the marriage registers of the country, and further analysing the groups referred to in the preceding paragraphs, by dividing each into two sections—by the one of which will be represented the population of highest education, and the other the population of lowest education;—in fact, so analysing the various districts and groups of counties, that they differ in respect of education only,—it is found, that out of the 22 different combinations formed of the various districts of England and Wales, in every instance there is an excess of crime where there is the least education or instruction: and comparing the respective sections of each group of counties, it will be seen that there is an average excess of 25 per cent. of crime in the sections of inferior education over that of higher education, and in some districts the excess is as much as 44 per cent.†

12. That it is hence obvious that the very small amount of education, or rather instruction, implied by the test here adopted, has a powerful influence on the criminal calendar of the country; and that the introduction of this further element into the investigation of the relative amount of crime, removes many anomalies not otherwise to be understood‡.

13. That all the preceding conclusions are arrived at from facts derived from a source partly independent of the criminal population itself; but this Contribution also furnishes evidence establishing the fact, that invariably, in those districts in which there is an increased amount of crime, there is also a higher ratio of uneducated criminals, and in the less criminal districts a smaller proportion of the criminal population wholly destitute of the rudest elements of education; and, in following up this inquiry, the following remarkable combination of elements determine the great influence of education in the development of crime. The districts of the country in which the general population is the worst educated, the districts in which the greatest amount of crime prevails, and the districts in which there is the highest proportion of uninstructed criminals, are constantly found assimilating; while, on the other hand, those districts which are the best educated, the least criminal, and in which a smaller proportion of uneducated criminals prevails, are likewise found to be identified in the various combinations§: and hence the great reduction of crime to be justly expected from the general diffusion of education.

\* See Tables XIV and XV.

† See pp. 363–4, and Table XVIII.

‡ See page 364.

§ See pp. 377–9, also Tables XXIV to XXVII inclusive.



14. That the highest proportion of criminals in the male sex wholly destitute of education is to be found in those committed for offences against property without violence—and least in the class of forgery and offences against the currency; but for the female sex, the lowest ratio was found in malicious offences against property, and the highest in the class of forgery and offences against the currency\*.

15. That the simultaneous increase of education and crime does not necessarily prove that education has no material influence on crime, so long as the criminal returns shew that, all other conditions being the same, crime is at a minimum when education is at a maximum, and *vice versa*. Changes in the political, manufacturing, and commercial aspects of the country—alterations in the police and criminal laws—have all their influence; and although for a period, or even a long series of years, crime may be on the increase, education may still be importantly concerned in the repression of crime†.

16. When viewed in its aggregate character, it is found that at the inferior ages there is a greater tendency to crime than at superior ages; but when viewed in its specific character, it is found that this law does not prevail: for while, in the class of offences against the person, at ages 21-30 there is an increased tendency of 20·95 per cent. above that for the preceding term of life, in all the other classes there is a less tendency, varying from 39 per cent. in offences against property with violence, to only 7·77 per cent. in cases of forgery and other offences against the currency: and at other ages, like differences will be found‡.

17. That it is hence evident, that no conclusions, as to the prevalence of crime, can be safely arrived at in questions of criminal jurisprudence, unless a proper analysis be made for the districts under investigation, shewing the tendency which exists to the specific forms of crime—and that too for each sex and at each term of life: for here we find, for two terms of life, a difference of 60 per cent. in the amount of crime dependent on the relative prevalence of two specific forms of offences; and it consequently follows, assuming in different districts the criminal tendencies of the population to be precisely the same, that (a), the fact of a difference in the distribution of the population at different ages will produce an apparent excess of crime, from the circumstance, that in some districts there is an excess of population at that term of life in which the tendency to some peculiar forms of crime is in maximum or in minimum;—or (b), on the other hand, assuming the distribution to be nearly, or exactly the same in two districts, a difference in the tendencies to specific forms of crime may be concealed by the neglect of the element of age or sex, and the districts falsely concluded to be in similar conditions as to their criminal manifestations; and a third error, (c), may result from the neutralising influences of these disturbing causes balancing each other. The excess of population at one particular term of life favourable to the

\* See pp. 389-91, also Table XXVIII.

† See pp. 390-1.

‡ See pp. 395-6, also Tables XXIX and XXX.



manifestation of a particular form of crime, may be counteracted by an equivalent amount of reduction in the tendency to the development of that specific form of crime: and hence all ignorance of these perturbations, and the remedial measures which a knowledge of them would induce. In criminal inquiries, therefore, they constitute elements of every correct investigation\*.

18. That although it has been usual of late to refer to juvenile delinquency in explanation of the increase of crime in many districts, the facts here presented do not sustain the supposition. An inspection of the nine groups of combinations represented in Tables XII and XIII, will shew, both for the general result, and for each group, that any increase or decrease in the amount of crime, as compared with the average of the country, is not accounted for so much by fluctuations in the tendency to crime at ages 10-15 and 15-20, as by the increase or decrease of crime at more advanced ages; leading to the conclusion that in the juvenile period of life the tendency to crime is under the influence of more constant laws or elements, and therefore shews less fluctuation than in mature life, when the conduct and disposition of individuals come more under the control of external circumstances. Further, a comparison of the results set forth in Table I and in Table XXX, shews that, from 20 to 60 years of age, there has been a gradual increase of crime, from the year 1834 to 1844, of from 20 to 31 per cent. varying with the age; but during the same years there has been at the younger ages, 15-20, a uniform decrease of 14·588 per cent., and in the four years, 1845-8, a further decrease of 6·388 per cent.; thus proving, by the facts of the case, that during a period of fifteen years, ending December 1848, there has been a decrease of crime among the population at the younger ages.

19. That to one class of offences—those against property committed without violence,—are due three-fourths of the whole crime of this country; and among the population of 16 years of age and under, more than nine-tenths of all their crimes belong to this single class of offences†.

20. That the nature of these offences obviously places the offenders within the reach of such remedial measures as would certainly, to a great extent, remove them from the criminal calendar, and thus go far toward the prevention of at least three-fourths of the crimes of this country.

\* See Tables I and II, and also Table XXX.

† See Table XXX.



## INFLUENCE OF LOCALITY ON SICKNESS.

---

THE next question to be brought under consideration is the Influence of Locality on the amount of Sickness among the members of Friendly Societies.

In Tables E and L, pp. 20-7 and 68-75 *ante*, the amount of sickness is given among a certain number of persons, at every year of life, expressed in weeks and decimals of a week; and in an adjacent column will be found the amount of sickness among the same number of persons in quinquennial periods of life, also the average amount of sickness to each individual per annum. In the same Table the amount of sickness under the various arrangements described for each of the Districts recognised in the Tables of Mortality is also given; and an inspection of the last column will give a general idea of the relative amount of sickness in those Districts.

Table V following has been formed from the last column of Tables E and L, by interpolating the terms for the intermediate years of age, by the method of third differences; and the adjusted results were afterwards obtained in the same manner as that described for the rates of mortality in Tables C and F, in the early part of this paper.

Owing to the greater practical convenience of collecting and arranging the data, as well as of subsequently applying the results to the more useful purposes of friendly societies, the amount of sickness throughout the whole of this paper is invariably expressed under the denomination of weeks. For example, in Table V, opposite to age 35, and under the head "Rural Districts," the decimal expression  $\cdot 8991$  signifies that the average amount of sickness to each individual per annum is that fraction of a week. And again, opposite the same age, in the column "City Districts," the average amount of sickness to each person in the course of a year is 1.2372 weeks. When, however, it is required to change the expression to the more scientific denomination of the fraction of a year, that may be easily done by multiplying any of the results by  $\cdot 019165$ .

[An examination



TABLE V.

*Average Sickness per Annum to each Person at the following Ages—Expressed in Weeks.*

| Age. | ENGLAND AND WALES. |                 |                 |                                  | SCOTLAND.                        | Age. | ENGLAND AND WALES. |                 |                 |                                  | SCOTLAND.                        |
|------|--------------------|-----------------|-----------------|----------------------------------|----------------------------------|------|--------------------|-----------------|-----------------|----------------------------------|----------------------------------|
|      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. | Rural, Town, and City Districts. |      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. | Rural, Town, and City Districts. |
| 10   | ·2257              | 1·2666          | ·3453           | ·4659                            | ·2197                            | 56   | 2·5240             | 3·4903          | 3·5246          | 2·8956                           | 2·8279                           |
| 11   | ·4233              | 1·0820          | ·3453           | ·5616                            | ·2197                            | 57   | 2·7756             | 3·7450          | 3·7545          | 3·1371                           | 3·0307                           |
| 12   | ·5969              | ·9392           | ·3453           | ·6412                            | ·2446                            | 58   | 3·0811             | 4·0670          | 3·9932          | 3·4293                           | 3·2841                           |
| 13   | ·7205              | ·8382           | ·3453           | ·7046                            | ·2945                            | 59   | 3·4402             | 4·4564          | 4·2408          | 3·7722                           | 3·5879                           |
| 14   | ·8041              | ·7788           | ·3453           | ·7520                            | ·3692                            | 60   | 3·8531             | 4·9132          | 4·4973          | 4·1657                           | 3·9423                           |
| 15   | ·8437              | ·7612           | ·3453           | ·7833                            | ·4689                            | 61   | 4·3198             | 5·4373          | 4·7626          | 4·6099                           | 4·3472                           |
| 16   | ·8414              | ·7853           | ·3453           | ·7984                            | ·5935                            | 62   | 4·9308             | 6·1219          | 5·0357          | 5·1904                           | 4·8894                           |
| 17   | ·8397              | ·8069           | ·3674           | ·8117                            | ·6946                            | 63   | 5·6863             | 6·9670          | 5·3167          | 5·9073                           | 5·5687                           |
| 18   | ·8387              | ·8259           | ·4115           | ·8230                            | ·7722                            | 64   | 6·5862             | 7·9726          | 5·6054          | 6·7605                           | 6·3853                           |
| 19   | ·8384              | ·8424           | ·4777           | ·8324                            | ·8264                            | 65   | 7·6305             | 9·1387          | 5·9019          | 7·7501                           | 7·3391                           |
| 20   | ·8387              | ·8564           | ·5659           | ·8398                            | ·8570                            | 66   | 8·8192             | 10·4652         | 6·2062          | 8·8760                           | 8·4302                           |
| 21   | ·8397              | ·8678           | ·6762           | ·8453                            | ·8642                            | 67   | 10·0700            | 11·7646         | 6·7643          | 10·0679                          | 9·6159                           |
| 22   | ·8426              | ·8746           | ·7713           | ·8515                            | ·8688                            | 68   | 11·3829            | 13·0368         | 7·5761          | 11·3257                          | 10·8964                          |
| 23   | ·8475              | ·8767           | ·8511           | ·8585                            | ·8709                            | 69   | 12·7579            | 14·2817         | 8·6417          | 12·6494                          | 12·2715                          |
| 24   | ·8542              | ·8741           | ·9157           | ·8661                            | ·8703                            | 70   | 14·1949            | 15·4995         | 9·9610          | 14·0391                          | 13·7414                          |
| 25   | ·8630              | ·8649           | ·9650           | ·8744                            | ·8672                            | 71   | 15·6940            | 16·6901         | 11·5341         | 15·4947                          | 15·3060                          |
| 26   | ·8736              | ·8551           | ·9991           | ·8834                            | ·8615                            | 72   | 17·1025            | 18·1368         | 13·5632         | 16·9652                          | 16·9019                          |
| 27   | ·8802              | ·8504           | 1·0303          | ·8915                            | ·8557                            | 73   | 18·4205            | 19·8395         | 16·0483         | 18·4506                          | 18·5292                          |
| 28   | ·8827              | ·8529           | 1·0584          | ·8988                            | ·8498                            | 74   | 19·6479            | 21·7984         | 18·9894         | 19·9509                          | 20·1877                          |
| 29   | ·8810              | ·8626           | 1·0837          | ·9052                            | ·8437                            | 75   | 20·7848            | 24·0134         | 22·3864         | 21·4661                          | 21·8777                          |
| 30   | ·8753              | ·8794           | 1·1059          | ·9107                            | ·8376                            | 76   | 21·8312            | 26·4844         | 26·2394         | 22·9963                          | 23·5989                          |
| 31   | ·8655              | ·9035           | 1·1252          | ·9154                            | ·8314                            | 77   | 22·7113            | 28·6170         | 29·4479         | 24·3088                          | 25·0897                          |
| 32   | ·8630              | ·9287           | 1·1480          | ·9250                            | ·8302                            | 78   | 23·4252            | 30·4112         | 32·0120         | 25·4036                          | 26·3501                          |
| 33   | ·8677              | ·9551           | 1·1742          | ·9396                            | ·8340                            | 79   | 23·9730            | 31·8669         | 33·9315         | 26·2809                          | 27·3800                          |
| 34   | ·8798              | ·9827           | 1·2040          | ·9591                            | ·8429                            | 80   | 24·3545            | 32·9841         | 35·2065         | 26·9405                          | 28·1795                          |
| 35   | ·8991              | 1·0114          | 1·2372          | ·9836                            | ·8567                            | 81   | 24·5698            | 33·7629         | 35·8370         | 27·3825                          | 28·7485                          |
| 36   | ·9257              | 1·0414          | 1·2740          | 1·0130                           | 8756                             | 82   | 24·8912            | 34·6970         | 36·3375         | 27·9052                          | 29·4124                          |
| 37   | ·9551              | 1·0819          | 1·3152          | 1·0474                           | ·8970                            | 83   | 25·3187            | 35·7864         | 36·7080         | 28·5086                          | 30·1713                          |
| 38   | ·9872              | 1·1330          | 1·3611          | 1·0869                           | ·9210                            | 84   | 25·8523            | 37·0310         | 36·9484         | 29·1927                          | 31·0250                          |
| 39   | 1·0221             | 1·1947          | 1·4114          | 1·1313                           | ·9476                            | 85   | 26·4920            | 38·4310         | 37·0588         | 29·9575                          | 31·9737                          |
| 40   | 1·0677             | 1·2669          | 1·4663          | 1·1808                           | ·9767                            | 86   | 27·2378            | 39·9863         | 37·0392         | 30·8030                          | 33·0174                          |
| 41   | 1·1002             | 1·3498          | 1·5258          | 1·2353                           | 1·0083                           | 87   | 27·5232            | 41·0552         | 37·0235         | 31·0985                          | 33·7581                          |
| 42   | 1·1398             | 1·4477          | 1·5901          | 1·2939                           | 1·0512                           | 88   | 27·3481            | 41·8378         | 37·0118         | 30·8440                          | 34·1959                          |
| 43   | 1·1786             | 1·5608          | 1·6593          | 1·3565                           | 1·1053                           | 89   | 26·7126            | 42·3340         | 37·0039         | 30·0394                          | 34·3308                          |
| 44   | 1·2166             | 1·6890          | 1·7335          | 1·4232                           | 1·1707                           | 90   | 25·6167            | 42·5438         | 37·0000         | 28·6849                          | 34·1628                          |
| 45   | 1·2537             | 1·8323          | 1·8125          | 1·4939                           | 1·2472                           | 91   | 24·0603            | 42·6673         | 37·0000         | 26·7804                          | 33·6918                          |
| 46   | 1·2900             | 1·9908          | 1·8964          | 1·5688                           | 1·3350                           | 92   | 22·0610            | 42·9661         | 37·0000         | 24·4216                          | 33·6451                          |
| 47   | 1·3417             | 2·1423          | 1·9954          | 1·6528                           | 1·4397                           | 93   | 19·6187            | 43·2402         | 37·0000         | 21·6085                          | 34·0225                          |
| 48   | 1·4089             | 2·2871          | 2·1095          | 1·7461                           | 1·5612                           | 94   | 16·7334            | 43·4896         | 37·0000         | 18·3411                          | 34·8242                          |
| 49   | 1·4915             | 2·4249          | 2·2388          | 1·8486                           | 1·6996                           | 95   | 13·4051            | 43·7143         | 37·0000         | 14·6194                          | 36·0500                          |
| 50   | 1·5896             | 2·5559          | 2·3831          | 1·9603                           | 1·8548                           | 96   | 9·6339             | 43·7143         | 37·0000         | 10·4434                          | 37·7000                          |
| 51   | 1·7031             | 2·6800          | 2·5426          | 2·0812                           | 2·0269                           | 97   | 6·6169             | 43·7143         | 37·0000         | 7·1026                           | 39·0200                          |
| 52   | 1·8335             | 2·8168          | 2·7144          | 2·2161                           | 2·1950                           | 98   | 4·3541             | 43·7143         | 37·0000         | 4·5970                           | 40·0100                          |
| 53   | 1·9808             | 2·9662          | 2·8985          | 2·3650                           | 2·3592                           | 99   | 2·0914             | 43·7143         | 37·0000         | 2·0914                           | 41·0000                          |
| 54   | 2·1450             | 3·1280          | 3·0949          | 2·5279                           | 2·5194                           | 100  | 2·0914             | 43·7143         | 37·0000         | 2·0914                           | 41·0000                          |
| 55   | 2·3260             | 3·3029          | 3·3036          | 2·7047                           | 2·6756                           |      |                    |                 |                 |                                  |                                  |



An examination of the rates of sickness as given for the Rural Districts will shew that it fluctuates up to the age of 32, and that from that age up to 87 there is a uniform and gradual increase. In the Town Districts the rate of sickness will be found subject to a similar increase from the age of 27 upwards; and in the City Districts the rate increases throughout the whole range of the Table. A comparison will shew a higher rate of sickness in the Town than in the Rural Districts, for the whole period of life. The rate of sickness in the City Districts will also be found higher than in the Rural Districts, from 23 to 63 years of age; it then continues at a lower rate up to the age of 75, when it again rises, and continues higher till the end of life. In the City Districts, from the age of 24 to 44, the sickness is also higher than in the Town Districts; but from 45 to 57 the rate in both Districts differs but little. After 57 years of age, to the end of life, there is a much higher rate of sickness in the Town than in the City Districts. The following Abstract of Table V will give a general view of the relative amount of sickness in the various Districts.

| Ages. | Average Sickness per Annum to each person—expressed in Weeks. |                 |                 |                               |
|-------|---------------------------------------------------------------|-----------------|-----------------|-------------------------------|
|       | Rural Districts.                                              | Town Districts. | City Districts. | The Three Districts combined. |
| 20    | ·8387                                                         | ·8564           | ·5659           | ·8398                         |
| 25    | ·8630                                                         | ·8649           | ·9650           | ·8744                         |
| 30    | ·8753                                                         | ·8794           | 1·1059          | ·9107                         |
| 35    | ·8991                                                         | 1·0114          | 1·2372          | ·9836                         |
| 40    | 1·0677                                                        | 1·2669          | 1·4663          | 1·1808                        |
| 45    | 1·2537                                                        | 1·8323          | 1·8125          | 1·4939                        |
| 50    | 1·5896                                                        | 2·5559          | 2·3831          | 1·9603                        |
| 55    | 2·3260                                                        | 3·3029          | 3·3036          | 2·7047                        |
| 60    | 3·8531                                                        | 4·9132          | 4·4973          | 4·1657                        |
| 65    | 7·6305                                                        | 9·1387          | 5·9019          | 7·7501                        |
| 70    | 14·1949                                                       | 15·4995         | 9·9610          | 14·0391                       |
| 75    | 20·7848                                                       | 24·0134         | 22·3864         | 21·4661                       |
| 80    | 24·3545                                                       | 32·9841         | 35·2065         | 26·9405                       |

Sickness will be found to follow to some extent the same law with regard to the influence of locality, that was observed to connect itself with mortality; being least in the Rural Districts, and increasing in amount in the other Districts; but it will be observed that the relation of cause and effect generally supposed to exist between sickness and mortality is not here manifested—in fact, the highest ratio of sickness is sometimes found associated with a favourable rate of mortality. In order to shew, however, the merits of this hypothesis for the general results of the Three Districts, a Table is subjoined shewing the increase per cent. in the rate of mortality in the Town and City Districts above the Rural, also the increased rate of sickness in the same Districts at the corresponding ages.



| Age. | Increased Mortality per Cent. above the Rural Districts in the |                | Increased Sickness per Cent. above the Rural Districts in the |                 | Age. |
|------|----------------------------------------------------------------|----------------|---------------------------------------------------------------|-----------------|------|
|      | Town Districts.                                                | City Districts | Town Districts.                                               | City Districts. |      |
| 20   | 27.6008                                                        | 12.7200        | 2.1104                                                        | 32.7650         | 20   |
| 30   | 5.4852                                                         | 30.5204        | 0.4684                                                        | 26.3338         | 30   |
| 40   | 20.4517                                                        | 75.7842        | 18.6560                                                       | 37.3419         | 40   |
| 50   | 35.5833                                                        | 61.6666        | 60.7220                                                       | 49.9182         | 50   |
| 60   | 51.5277                                                        | 41.0185        | 27.5130                                                       | 16.7200         | 60   |
| 70   | 43.2990                                                        | 26.7248        | 9.1906                                                        | 29.8191         | 70   |

In addition to this, abundant evidence, illustrative of this point, is furnished out of the present materials. For example, labourers, although influenced by the most favourable rate of mortality, are found to be subject to as high an amount of sickness as the general average; and so some other occupations also, in which the rate of mortality is also favourable, are found subject to a rate of sickness much above the average.

Again, the sickness among the sixteen trades referred to in pp. 58 *et seq.*, *ante*, is less than the general average, although, as has been shewn, they experience a greater mortality. Bakers also, at the early and middle periods of life, are less subject to sickness than the general average, and among them there is likewise a higher mortality. The class of Butchers seems to experience a very high rate of mortality, although not subject to above the average amount of sickness. In applying the test of mortality to various localities and employments there is no difficulty; but the case is very different in viewing sickness as an index of the sanitary condition of any trade or of any locality. What constitutes sickness in one case, is often a very different thing from that in another. The standard seems too indefinite and capricious; and although the results as obtained may be considered perfect for all the purposes of friendly societies, a careful inquiry will shew their vague nature for medical and other scientific purposes, unless carried further than the mere amount of sickness, without regard to the circumstances under which it has taken place, and the causes producing it. Taking two occupations—Tailors and Clerks—which happen to be of readiest reference, they are found subject to a very high rate of mortality; still they do not seem, particularly Clerks, to be subject to so much as the average amount of sickness; and on consideration of the nature of those employments, it will immediately suggest itself, that the same trivial circumstances which would be sufficient to disable Sawyers, and also Colliers and Miners, would have little effect on those following quiet occupations. Sawyers, Colliers, and Miners are subject to accidents and various injuries which cannot be considered constitutional disease or sickness; yet it entitles them to relief from benefit societies, and they will of course be returned on the sick list. Tailors and Clerks are less subject to those accidents, and accordingly their sickness is also less; the other classes, particularly Colliers and Miners, being much above the average.



But the most striking refutation of the theory, that sickness and mortality bear the relation to each other of cause and effect, will perhaps be derived from a comparison of the general results of mortality in friendly societies in England for all districts combined, as given in Table F, page 32, with that for Scotland in Table M, page 80 *ante*. The result of this comparison will be, that the rate of mortality in Scotland among the members of friendly societies is found to be much higher than among the same class in England; and if the theory just recited were to hold good, there should also be found a greater amount of sickness in Scotland; but an inspection of Table V in this paper will shew that such is not the case, and that instead of there being an increased ratio of sickness, the ratio is actually below that in England. Nothing further, therefore, need be said on this part of the subject; but the argument may be rendered more obvious by an inspection of the following Abstract, in which it will be seen that while the excess of mortality is uniformly against Scotland, the excess of sickness is as constantly against England.

| Age. | Mortality per Cent. in |           | Excess of Mortality in Scotland per Cent. | Average Sickness yearly in |           | Excess of Sickness in England per Cent. |
|------|------------------------|-----------|-------------------------------------------|----------------------------|-----------|-----------------------------------------|
|      | England.               | Scotland. |                                           | England.                   | Scotland. |                                         |
| 30   | ·7563                  | ·7926     | 4·7997                                    | ·9107                      | ·8376     | 8·0268                                  |
| 40   | ·9386                  | 1·0767    | 14·7134                                   | 1·1808                     | ·9767     | 17·2849                                 |
| 50   | 1·4267                 | 1·5830    | 10·9538                                   | 1·9603                     | 1·8548    | 5·3818                                  |
| 60   | 2·5054                 | 2·9096    | 16·1331                                   | 4·1657                     | 3·9423    | 5·3628                                  |

The nature of the information in the schedules relating to the societies in England would evidently satisfy many speculations as to the cause, duration, and mortality of sickness and disease; but as it is proposed to give in this paper a simple representation of the amount of sickness only in the different districts, all inquiries, however interesting and instructive, as to the ratio of sickness to mortality, under the various circumstances which present themselves of employment and disease, must for the present remain untouched.

The next part of the subject naturally arising in this paper is, the relation which the average amount of sickness, as developed by this inquiry, bears to the amount of sickness as hitherto shewn in other sickness Tables.

The only Tables published prior to the first edition of this work to which it is deemed necessary in the first place to make reference, are those contained in the Highland Society's Report for 1824, and the Tables given in the highly valuable work by Mr. Ansell on friendly societies, and published in 1835 under the superintendence of the Society for the Diffusion of Useful Knowledge. The following will shew the relative amount of sickness per annum to each person at given ages according to those Tables, and also according to the results of the present inquiry.



TABLE W.

*Sickness per Annum to each Person—expressed in Weeks.*

| Age. | Highland Society. | Ansell. | Three Districts Combined, Table V. | Age. | Highland Society. | Ansell. | Three Districts Combined, Table V. |
|------|-------------------|---------|------------------------------------|------|-------------------|---------|------------------------------------|
| 21   | ·575              | ·780    | ·8453                              | 46   | 1·032             | 1·411   | 1·5688                             |
| 22   | ·576              | ·785    | ·8515                              | 47   | 1·108             | 1·475   | 1·6528                             |
| 23   | ·578              | ·791    | ·8585                              | 48   | 1·186             | 1·544   | 1·7461                             |
| 24   | ·581              | ·798    | ·8661                              | 49   | 1·272             | 1·619   | 1·8486                             |
| 25   | ·585              | ·806    | ·8744                              | 50   | 1·361             | 1·701   | 1·9603                             |
| 26   | ·590              | ·815    | ·8834                              | 51   | 1·451             | 1·791   | 2·0812                             |
| 27   | ·596              | ·825    | ·8915                              | 52   | 1·541             | 1·890   | 2·2161                             |
| 28   | ·603              | ·836    | ·8988                              | 53   | 1·633             | 1·999   | 2·3650                             |
| 29   | ·611              | ·848    | ·9052                              | 54   | 1·726             | 2·120   | 2·5279                             |
| 30   | ·621              | ·861    | ·9107                              | 55   | 1·821             | 2·256   | 2·7047                             |
| 31   | ·631              | ·876    | ·9154                              | 56   | 1·918             | 2·410   | 2·8956                             |
| 32   | ·641              | ·893    | ·9250                              | 57   | 2·018             | 2·586   | 3·1371                             |
| 33   | ·652              | ·912    | ·9396                              | 58   | 2·122             | 2·788   | 3·4293                             |
| 34   | ·663              | ·933    | ·9591                              | 59   | 2·230             | 3·021   | 3·7722                             |
| 35   | ·675              | ·956    | ·9836                              | 60   | 2·346             | 3·292   | 4·1657                             |
| 36   | ·688              | ·981    | 1·0130                             | 61   | 2·500             | 3·611   | 4·6099                             |
| 37   | ·702              | 1·009   | 1·0474                             | 62   | 2·736             | 3·991   | 5·1904                             |
| 38   | ·718              | 1·040   | 1·0869                             | 63   | 3·100             | 4·448   | 5·9073                             |
| 39   | ·737              | 1·074   | 1·1313                             | 64   | 3·700             | 5·001   | 6·7605                             |
| 40   | ·758              | 1·111   | 1·1808                             | 65   | 4·400             | 5·672   | 7·7501                             |
| 41   | ·784              | 1·151   | 1·2353                             | 66   | 5·400             | 6·486   | 8·8760                             |
| 42   | ·814              | 1·195   | 1·2939                             | 67   | 6·600             | 7·471   | 10·0679                            |
| 43   | ·852              | 1·243   | 1·3565                             | 68   | 7·900             | 8·659   | 11·3257                            |
| 44   | ·902              | 1·295   | 1·4232                             | 69   | 9·300             | 10·086  | 12·6494                            |
| 45   | ·962              | 1·351   | 1·4939                             | 70   | 10·701            | 11·793  | 14·0391                            |

For the sake of a more convenient and general view of the relative merits of those different results, the following Abstract is given.

| Age. | Annual Amount of Sickness to Each Person—expressed in Weeks. |         |                                    |                                          |                                |
|------|--------------------------------------------------------------|---------|------------------------------------|------------------------------------------|--------------------------------|
|      | Highland Society.                                            | Ansell. | Average of all Districts, Table V. | Excess per Cent. above Highland Society. | Excess per Cent. above Ansell. |
| 20   | ·575                                                         | ·776    | ·840                               | 31·5476                                  | 7·6190                         |
| 30   | ·621                                                         | ·861    | ·911                               | 31·8331                                  | 5·4884                         |
| 40   | ·758                                                         | 1·111   | 1·181                              | 35·8171                                  | 5·9272                         |
| 50   | 1·361                                                        | 1·701   | 1·960                              | 30·5612                                  | 13·2142                        |
| 60   | 2·346                                                        | 3·292   | 4·166                              | 43·6869                                  | 20·9798                        |
| 70   | 10·701                                                       | 11·793  | 14·039                             | 23·7766                                  | 23·0636                        |

The remarkable increase in the amount of sickness, as shewn by the present results, beyond the two other Tables, will no doubt appear very startling to those not intimately



familiar with the condition of friendly societies throughout the country. The rate of sickness as given in the Table of the Highland Society has been long and generally acknowledged to be much below the actual average, and even so far back as 1825 it was thought unfavourably of by a Committee of the House of Commons. It is unnecessary to enter into the objections against the nature and source from which the data for the Highland Society's Table were obtained, as that subject has been amply discussed elsewhere. For some time after Mr. Ansell's work appeared, it was thought that contributions calculated according to the increased amount of sickness shewn in his Tables would render friendly societies perfectly safe; but instances occur almost daily of societies breaking down, whose contributions approximate to those Tables; and recently the increased amount of sickness has become so apparent to the members of some of the best regulated societies, that meetings have been held, and reports of a very clear and apposite kind published, pointing to the increased amount of sickness as the cause of their falling condition. A knowledge of circumstances of this kind first led to the present inquiry, the original object of which was simply to answer the question, whether friendly societies were actually subject to a higher rate of sickness.

Mr. Ansell's data had reference to the five years 1823-27; and it is difficult to account for the difference between his Tables and the present results, unless it be considered that the imperfect manner in which the affairs of friendly societies at that period were managed, did not allow of so accurate information being then obtained as now, when required by Act of Parliament to make quinquennial returns. In Scotland, at the time even of collecting the data for this inquiry, it was found that quadruple the societies would have filled up schedules in competition for the prizes offered, but were prevented from doing so by the incomplete system in which their books were kept. It is not improbable that the difference of the two classes of results may be partially accounted for by the smallness of the numbers over which his observations extended, as in the aggregate they amounted to 24323 years of life only, or about 5000 persons for a period of five years. If this fact is considered, and at the same time the irregularities which peculiarity of employment and other circumstances have been shewn to produce, it will not be difficult to account for the discrepancy. If the nature of Mr. Ansell's treatise had required an enumeration of these features, it would have been interesting to have traced the cause.

It is not believed that the mere fact of small numbers would, of itself, be sufficient to account for the difference, without at the same time a peculiarity in the combination of the employments of the persons composing those numbers; for not the least remarkable feature which has appeared in the present inquiry is, the uniformity of the results as to sickness, with even smaller numbers than those included in Mr. Ansell's statement, when all the facts recorded were under similar circumstances as to locality and employment.



In order to give a still further and comprehensive view of the several Tables over periods of years, the following arrangement may be useful.

TABLE X.

*Comparative amount of Sickness in various periods of Years according to the Sickness Tables of the Highland Society, the Tables by Mr. Ansell, and the Results of this Inquiry.*

| From Age. | Amount of Sickness in each period of Years—expressed in Weeks. |         |                                  |                                         |                               |
|-----------|----------------------------------------------------------------|---------|----------------------------------|-----------------------------------------|-------------------------------|
|           | Highland Society.                                              | Ansell. | Average for the Three Districts. | Excess per Cent. over Highland Society. | Excess per Cent. over Ansell. |
| 20 to 30  | 5.870                                                          | 8.060   | 8.7145                           | 32.6410                                 | 7.5100                        |
| 30 ... 40 | 6.728                                                          | 9.535   | 9.9120                           | 32.1227                                 | 3.8035                        |
| 40 ... 50 | 9.670                                                          | 13.395  | 14.7999                          | 34.6617                                 | 9.4926                        |
| 50 ... 60 | 17.827                                                         | 22.565  | 27.0894                          | 34.1920                                 | 16.7120                       |
| 60 ... 70 | 47.982                                                         | 58.717  | 77.3029                          | 37.9290                                 | 24.0420                       |
| 70 ... 80 | ...                                                            | ...     | 205.3562                         | ...                                     | ...                           |
| 20 ... 40 | 12.598                                                         | 17.595  | 18.6265                          | 32.3652                                 | 5.5378                        |
| 30 ... 50 | 16.398                                                         | 22.930  | 24.7119                          | 32.8775                                 | 7.2107                        |
| 40 ... 60 | 27.491                                                         | 35.957  | 41.8893                          | 34.3723                                 | 14.1618                       |
| 50 ... 70 | 65.803                                                         | 81.279  | 104.3923                         | 36.9650                                 | 22.1400                       |
| 60 ... 80 | ...                                                            | ...     | 282.6591                         | ...                                     | ...                           |
| 20 ... 50 | 22.268                                                         | 30.990  | 33.4264                          | 33.3820                                 | 7.2888                        |
| 30 ... 60 | 34.219                                                         | 45.492  | 51.8013                          | 33.9416                                 | 12.1798                       |
| 40 ... 70 | 75.473                                                         | 94.674  | 119.1922                         | 36.6796                                 | 20.5703                       |
| 50 ... 80 | ...                                                            | ...     | 309.7485                         | ...                                     | ...                           |
| 20 ... 60 | 40.089                                                         | 53.552  | 60.5158                          | 33.7545                                 | 11.5074                       |
| 30 ... 70 | 82.201                                                         | 104.209 | 129.1042                         | 28.5841                                 | 19.2831                       |
| 40 ... 80 | ...                                                            | ...     | 324.5484                         | ...                                     | ...                           |
| 20 ... 70 | 88.071                                                         | 112.269 | 137.8187                         | 36.0965                                 | 18.5386                       |
| 30 ... 80 | ...                                                            | ...     | 334.4604                         | ...                                     | ...                           |
| 20 ... 80 | ...                                                            | ...     | 343.1749                         | ...                                     | ...                           |

An inspection of the fifth and sixth columns of the above Table will afford the most conclusive evidence of the increased ratio of Sickness above that set forth in previous Tables. To those interested in the progress of friendly societies the results are highly important, as they will demonstrate the impossibility of permanence in those institutions on their present foundations. Considering the immense number of those societies which have broken down, it is lamentable to think that so little should have been done to ascertain the real nature and extent of the risks to which they are subject. It is still more remarkable that so many legislative enactments should have occupied the attention of the Government of the country from time to time, and that Committees also of the House of Commons should have had the condition of those societies for several years under con-



sideration, without any practical measure being carried out for collecting and arranging data in a proper shape to point out the true character of the liabilities to which they are subject\*. In fact, the encouragement given to the formation of those societies by some recent Acts of Parliament should be regarded as an evil rather than as a benefit to the working classes. An immense number of societies were formed in a very short period, and their contributions regulated by the most delusive and inadequate data, so that at the present time very few are to be found calculated to survive many years. Under a scientific and amply developed system, those societies would be enabled, at no distant period, completely to remove the cause of nearly all that poverty, distress, and misery, which haunt our manufacturing towns, and fill our workhouses with the working classes of the country; but owing to the imperfect and unstable foundation on which they are at present built, instead of being a help and a support to a poor man, they involve him in those difficulties for which he might otherwise have provided. On becoming a member of such a society, he reasonably looks forward to it as a support for his declining years, and a protection during periods of sickness and disease; but ultimately, at the very time when assistance is required, he discovers that the society has been formed on a ruinous plan, that the increasing years and infirmities of its members have absorbed all its funds, and that those surviving must be thrown destitute on the parish as a public charity. To this, by the most ill conceived of all proceedings, the legislation of the Government has hitherto tended. Every facility and encouragement are given to the formation of societies, without any help or information for their management or guidance. The ship is cast upon the waves without rudder or compass, and the safety of the vessel left to accident and chance.

As stated, a Committee of the House of Commons in 1825, reported unfavourably of the table of sickness furnished in the preceding year by the Highland Society; still no other data were supplied on which any more confidence could be placed: the consequence was, that societies were formed, and continued to be managed, on calculations resulting from the same data; and, even up to the present time, thousands of those Societies are conducted either on those terms, or terms still less adequate to carry out the purposes contemplated.

An inspection of Column 4 of the preceding Table will shew that, in the decennial periods of life for 20-70, the friendly societies in England and Wales experience an excess of sickness of from 32 to 37 per cent. above that indicated in the Table of the Highland Society, or an average increase of sickness over the whole of that period of fifty years of 36.096 per cent.; or, in other words, friendly societies actually experience about one hundred and thirty-eight weeks' sickness in fifty years, while the Highland Society Table would lead them to expect eighty-eight weeks only.

\* Since these remarks were written, in the year 1845, a Return of the Sickness and Mortality experienced by Friendly Societies, during the quinquennium ending the 31st of December, 1851, has been printed by the order of the House of Commons.—See Parliamentary Paper of 1853, No. 955, also that of 1854, No. 506.



The ruin of any society, under such conditions, is inevitable. There are many other errors in the rules of friendly societies, connected with the various benefits which they promise, calculated to ruin their schemes; but if it were necessary here to cite instances in which societies have suffered from the simple feature of excessive sickness, abundant instances could be pointed out; and the internal evidence contained in this paper, of the actual rate of sickness experienced by societies in the aggregate, must also prove that individual societies have been sufferers. In illustration of this point, it is impossible to avoid quoting a passage from a very able report, dated 8th of February, 1841, submitted to the Edinburgh Compositors' Society, by a committee appointed to revise the laws. They state, in their report, that the contributions and benefits of the society were regulated by the data of the Highland Society; and, in order to discover whether the experience of the society had harmonised with the original data from which their calculations resulted, an investigation of the actual sickness in the society was made, of which the following is an Abstract:—

| Age.       | Number of Members. | Actual Sickness in the Society. |       | Amount of Sickness Expected by the Highland Society Tables. |       | Excess of Actual Sickness. |       |
|------------|--------------------|---------------------------------|-------|-------------------------------------------------------------|-------|----------------------------|-------|
|            |                    | Weeks.                          | Days. | Weeks.                                                      | Days. | Weeks.                     | Days. |
| 20 to 30   | 732                | 979                             | 1     | 417                                                         | 0     | 562                        | 1     |
| 30 ... 40  | 580                | 863                             | 5     | 398                                                         | 1     | 465                        | 4     |
| 40 ... 50  | 126                | 191                             | 5     | 129                                                         | 3     | 62                         | 2     |
| 50 ... 60  | 11                 | 12                              | 2     | 20                                                          | 4     | —8                         | 2     |
| Total..... | 1449               | 2047                            | 1     | 965                                                         | 2     | 1081                       | 5     |

It will thus be seen that the actual sickness experienced by this society has exceeded that contemplated by the Highland Society Tables by no less an amount than 112 per cent.

The following gives the amount of sickness as experienced by this society, and also according to the results of various Tables.

|                                                         | Weeks. | Days. | Excess of Sickness in Compositors' Society, Weeks. Days. |     |
|---------------------------------------------------------|--------|-------|----------------------------------------------------------|-----|
| Amount of Sickness in Compositors' Society              | 2047   | 1     | ...                                                      | ... |
| Ditto, Highland Society Tables                          | 965    | 2     | 1081                                                     | 5   |
| Ditto, Ansell's Table                                   | 1357   | 0     | 690                                                      | 1   |
| Results as given in this Paper, City Districts, Table V | 1748   | 0     | 299                                                      | 1   |
| Results as developed in { Printers                      | 2000   | 0     | 47                                                       | 1   |
| { Colliers and Miners                                   | 2146   | 0     | —98                                                      | 5   |

or ninety-eight weeks and five days less Sickness in the Compositors' Society than among Colliers and Miners.



It will thus appear, that while there was in the society an excess of 112 per cent. above the Highland Society's Table, and also an excess of 51 per cent. above Mr. Ansell's Table, there is an excess of only 17 per cent. above the results obtained in the present inquiry, for the average of all trades in the City Districts, and of 2 per cent. above the general class Printers, which includes both Compositors and Pressmen; but there is at the same time also actually less sickness than among Colliers and Miners by nearly 5 per cent.

It has been shewn that particular trades and employments are subject to different degrees of sickness and mortality, and the importance of this element in considering the health of towns, and the influence of locality on the duration of life, has already been pointed out; but in viewing the condition of friendly societies, the necessity of considering the peculiar effect of certain trades and occupations must appear to be of vital importance. A most remarkable disparity exists between the rates of sickness prevalent in different places and in different employments, and societies may run the greatest hazard by incautiously adopting each other's regulations or tables; for so great is the distinction which obtains between the liabilities incurred from members of different trades, that what would be sufficiently safe for one society might completely ruin another. It may seem to some that the excessive amount of sickness experienced by the Compositor's Society may be accounted for by the fluctuation in small numbers, but on reference to the report itself such will not be found to be the case. The facts extend over a term of sixteen years, and the results for the various periods are pretty uniform, and cannot be looked upon as the result of any accident, but must be regarded as a distinctive and proper feature of that trade to which the members of the society belong.

In calculating Tables for the guidance of such a society, it would evidently not be safe to assume the results for the general average of the Country or a given District as a sufficient basis to proceed upon; for, allowing such to be the case, and adopting even the present results as a standard of calculation, there would still be 17 per cent. of the sickness in the above society unprovided for. The remark in respect to the rates of mortality in different trades and occupations, is also true of sickness: the present inquiry cannot therefore be regarded as complete till the results for the various employments are published.

Other societies in Edinburgh, it will be seen from a following quotation from the report in question, have also experienced an increased amount of sickness beyond the rates of the Highland Society's Table, although the sickness in those societies has not equalled in amount that of the Compositors' Society. It is stated that the sickness in those societies amounted "on an average to no less than 87 per cent. more than the Highland Society's rate." Considering this statement, from the accuracy of detail in other parts of the same report, to be correct, it seems to be a very remarkable coincidence, that in the City Districts, being that with which those societies should be brought into comparison, there is, according to the results of this investigation, at the same term of life also exactly 87



per cent. more sickness than that given in the Highland Society's Table. From 20 to 60 years of age, according to the Highland Society's Table, (see page 415,) there is forty weeks' sickness to each person; but according to the City Districts, Table V, there is seventy-five weeks' sickness, or 87 per cent. more than given in the Highland Society's Table.

The practical advantage of thus recognising particular districts and occupations is obvious; for had either of the preceding questions been tested by the results for the general average, no satisfactory solution could have been offered. Hence the reason why some friendly societies go on prospering, while others, under apparently the same management and scheme, survive but for a short term of years, ultimately to involve their members in ruin when most in need of support. The following Extract from the Report of the Committee in question is important:—

“ The average annual sickness to an individual is as follows :—

|                             |     |     |   |   |   | Compositors' Society. |       |        | Highland Society. |       |        |
|-----------------------------|-----|-----|---|---|---|-----------------------|-------|--------|-------------------|-------|--------|
|                             |     |     |   |   |   | Weeks.                | Days. | Hours. | Weeks.            | Days. | Hours. |
| From 20 to 30 years of age, | .   | .   | . | . | . | 1                     | 2     | 1      | 0                 | 4     | 3      |
| ... 30 ... 40 ...           | ... | ... | . | . | . | 1                     | 2     | 22     | 0                 | 4     | 19     |
| ... 40 ... 50 ...           | ... | ... | . | . | . | 1                     | 3     | 3      | 1                 | 0     | 4      |
| ... 50 ... 60 ...           | ... | ... | . | . | . | 1                     | 0     | 17     | 1                 | 6     | 3      |

“ From a comparison of these two rates, it will be seen that the sickness experienced by this society has been more than double that given by the Highland Society. Since ascertaining this result, the Committee have made various inquiries in order to ascertain how far this increase corresponded with the experience of other societies established on similar principles; and they have to report, as the result of these inquiries, that in Heriot's Benefit Society, the School of Arts, the Goldsmiths' Equitable, the Journeymen Goldsmiths', and in the Cabinet and Chairmakers' Societies, a very great increase had also been experienced, amounting, on an average of these societies, to no less than 87 per cent. more than the Highland Society's rate. Great, however, as this increase appears, it is easy to be accounted for when the state of societies is considered during the period embraced by the Highland Society's inquiry. It is well known that up to the period of the publication of the Highland Society's Report, societies generally partook very much of a charitable character, no member being entitled to benefits unless he was in indigent circumstances. Now, when it is considered that the Highland Society's rate of sickness was deduced from the amount of sickness experienced by the 79 societies above mentioned, during a period when they were formed upon this charitable principle, it is not to be wondered at that now, when they are established upon strictly self-supporting insurance principles, and when, in consequence, each member claims the utmost extent of the benefits, the sickness should be found to be so much greater than was at first



supposed. This, the Committee conceive, is quite sufficient to account for the great disparity between the rate of sickness given by the Highland Society, and that now found to occur among societies."

The preceding comparisons did not extend beyond 60 years of age; but, as will appear from subsequent illustrations to be given in this paper, the claims to be made by members after passing their sixtieth year become generally so alarming, as to be the usual means of awakening societies to the danger of their position. For example, although in the Compositors' Society all the members were under 60 years of age, still there was a large amount of what is called permanent sickness. At page 6 of the Report in question, it will be seen that of the members actually sick,

|                |     |                          |
|----------------|-----|--------------------------|
| 91.0 per cent. | had | 7½ weeks' sickness each; |
| 3.5            | ... | 69                       |
| And 5.5        | ... | 246                      |

It will thus appear, that the amount of sickness among 5.5 per cent. of the members was actually more than double that experienced by another class of the same society by 91 per cent. When the subject of permanent sickness is brought forward, its relation to age, its effect on the funds of a society, and the methods by which the future liabilities of a society may be determined, will be amply discussed.

Having entered so fully into the characteristic features of the Highland Society's Table, in relation to the results of this inquiry, a simple inspection of the Table at page 415, will be sufficient to shew to what extent Mr. Ansell's Table is liable to the same objections. At the decennial periods of life, from 30-70, it will be seen that there is an excess of sickness in the friendly societies in England and Wales over Mr. Ansell's Table, varying from 4 to 24 per cent., or a mean difference over the whole of that period of forty years of 19.283 per cent. This excess of sickness, as well as all the other results in page 415, are derived from making Table V the standard of comparison; but if Mr. Ansell's Table were taken as the standard of comparison, the deficiency in sickness over that period of years would be 23 instead of 19 per cent., and at ages 60-70 the deficiency would be 31 instead of 24 per cent., as given at page 415, or a deficiency of nearly one-third. But the inadequacy of his Table as a general guide for friendly societies, will instantly appear by making it bear on the results of Table V for the City Districts, in which, as already stated, the amount of sickness from 21-60 years of age is seventy-five weeks, being an excess over Mr. Ansell's Table, for that period of life, of no less than 41 per cent. The greatest care and discrimination should therefore be exercised, in established friendly societies, not to adopt general results for the guidance of particular classes. The laws of sickness and mortality are under peculiar modifications in each class, and must be developed before any safe practical conclusions can be arrived at, deserving of public confidence.



In connection with the preceding remarks, Odd Fellows will naturally inquire whether the same observations are equally applicable to their own Order or Institution. An analysis has been made of the return issued in October 1845, by the Board of Directors at Manchester; and among other important information, there is given the amount of sickness and mortality in the various districts of the Unity during the year 1844. An inspection of the results of this analysis is highly calculated to inspire confidence in the preceding observations, and to shew that the rate of sickness there developed is strictly applicable for the guidance of the Order. As the return by the Board of Directors extends over 3682 lodges, and about one quarter of a million of members, great care has been bestowed on the reduction of the analysis presented in the various parts of this paper, in order that it may be safely relied on as a standard for future reference.

The average age of the members in the Manchester Unity is stated by the Board of Directors to be 32 years, and the gross amount of sickness experienced by 243,122 members, being the average number during the year 1844, was 226,917 weeks, or  $\cdot 933$  weeks to each member. On referring to Table V, p. 409 *ante*, it will be found that at age 32 the average sickness per annum is  $\cdot 9250$  weeks,—or, when the necessary correction for the maximum ages is applied in the former case, producing, in both instances, 6 days 11 hours to each member, yearly. It must, therefore, be very gratifying to every one interested in the progress of Benefit Associations for the working and middle classes, to find, that the amount of sickness among the members of those clubs, however variously constituted, shews so near an agreement, and effects almost a perfect realisation of a permanent law of sickness.

Again: as to the mortality experienced by the Order, the same conformity to the results given in these Contributions will be found to manifest itself. Every previous investigation into the laws of mortality produced the conviction, that the lives of the working classes of the country were of shorter duration than those of the upper classes, and also of less value than the average results for the whole kingdom: but here we have a confirmation of the fact, that the industrious workmen of the country experience an increased duration of life.

At age 32, the mortality of males for the whole of England and Wales is one in 95; the mortality in the Manchester Unity is one in 106; and, according to the results as given in this paper, for all classes in friendly societies at age 32, the mortality is one in 128. To illustrate further this point of the inquiry, the following Abstract will be useful, being an analysis of the actual results in the Manchester Unity of Odd Fellows for the year 1844.

In explanation of this Table, it may be stated that the Rural District is composed of those places the population of which is under 5000, the Town District of those places the population of which is 5000 and under 30,000, and the City District of such places as have a population of 30,000 and upwards.



TABLE Y.

| District.      | Average No. of Members during 1844. | Deaths of Members. | Death of Members' Wives. | No. of Week's Sickness. | No. of Members out of which |                         | Average Sickness yearly to each Member expressed in Weeks. |
|----------------|-------------------------------------|--------------------|--------------------------|-------------------------|-----------------------------|-------------------------|------------------------------------------------------------|
|                |                                     |                    |                          |                         | One Member died.            | One Member's Wife died. |                                                            |
| Rural . . . .  | 66208                               | 608                | 434                      | 57795                   | 108.89                      | 152.55                  | 0.873                                                      |
| Town . . . .   | 77070                               | 700                | 554                      | 70435                   | 110.10                      | 139.01                  | 0.913                                                      |
| City . . . .   | 99848                               | 978                | 662                      | 98687                   | 102.09                      | 150.83                  | 0.988                                                      |
| Whole Unity* . | 243126                              | 2286               | 1650                     | 226917                  | 106.35                      | 147.34                  | 0.933                                                      |

During the year 1844, it will be seen that the mortality for the whole Unity was, as already stated, about one to every 106 members ; while for the Rural districts it was one in 109, for the Town districts it was one in 110, and for the City districts it was one in 102.

The average amount of sickness to each member during the same year was, for the—

Rural Districts . . . . 0.873 weeks, or 6 days, 3 hours.

Town Districts . . . . 0.913 ... 6 ... 9 ...

City Districts . . . . 0.988 ... 6 ... 22 ...

Whole Unity . . . . 0.933 .. 6 ... 13 ...

But according to the results in these "Contributions," already adverted to, the average amount of sickness for the same districts would be—

Rural Districts . . . . 0.863 weeks, or 6 days 1 hour.

Town Districts . . . . 0.929 ... 6 ... 12 ...

City Districts . . . . 1.148 ... 8 ... 1 ...

Three Districts combined . 0.925 ... 6 ... 11 ...

In instituting the above comparison, it should be kept in view that the actual ages of all the members in the Unity during that year are unknown ; but as the Directors, in their Report, have stated the average age to be 32, that age has been taken as the point of comparison. For refined purposes, objections can be brought against this step, but for the present illustration it is sufficiently correct.

Considering that the above results from the experience of the Order relate to one year only, it is the more remarkable to find them approximate so closely to the results given in the preceding portion of these Contributions from facts extending over several years.

It is evident, then, that the Manchester Unity of Odd Fellows is subject to as much sickness and mortality as that shewn in this paper. The evidence thus derived from the

\* In the original Report issued by the Board of Directors, several errors occurred in the figures, but the above results are correct.



working of the Order itself, should be a sufficient answer to those who have hitherto argued that the favourable circumstances in which the members were placed, exposed them to less hazard than the members of ordinary friendly societies. The facts of the case, it will be seen, do not support the supposition. It is, therefore, obvious that rates of contribution less favourable than those set forth in the Tables here given, would be unsafe for the guidance of the Order.

Since these remarks were written, the question as to "Whether the experience of other friendly societies in regard to sickness was fairly applicable to Odd Fellow Societies," has undergone much discussion, and assumed a public interest.

The investigation, evidence, and reports published by Lord Beaumont's Committee of the House of Lords on Provident Associations, Sessions 1847-8, paper No. 126: and by Mr. Sotheron's Committee of the Commons, in the Session 1849, paper No. 548, also seem to be chiefly directed to the same question, namely, whether the data published by Mr. Ansell as well as the data in "Contributions to Vital Statistics," but more particularly the latter, were applicable to the purposes of Friendly and Odd Fellow Societies. By the witnesses examined before these Committees on behalf of the Odd Fellows, every species of evidence seems to have been urged to make it appear that the members of such clubs were not so liable to sickness as the members of friendly societies generally throughout the country; and the results of the publication by Mr. Ratcliffe, in the year 1850, acquire, in consequence, an additional interest: as they exhibit the actual experience of the Order, deduced from carefully conducted observations on the experience of the whole of the members during the three years of 1846-8; and they are valuable as testing the speculative opinions of the different witnesses examined by the Committee.

In the concluding portions of the earlier editions of the present treatise, published in 1845, we find the following remarks:—

One of the most efficient means of awakening attention to the perilous condition of the Order would be the publication of well digested records of the experience of the various lodges, from the most remote periods of which their books admit; and a proper and skilful analysis of these extensively circulated, could not fail to give birth to much useful conversation and debate, ultimately resulting in important and highly beneficial reforms. Science would also be greatly aided by the facts and testimony of such records, and the literature of the Order acquire an importance in the community not otherwise easily attainable. The expense to each lodge of contributing its experience would be very trifling, while the advantages to the Unity would be immense.

It appears that Odd Fellows have acted on this advice; or, at all events, have followed in the precise course prescribed; for Mr. Ratcliffe, in his Report on the sickness experienced by the Order during the year 1848, says—

The Bristol A. M. C. having empowered the Directors to issue return-sheets, to be filled up by each lodge, containing the initials, trade, and age of every member; and the amount of sickness and deaths



occurring during the year ; and such resolution having been repeated at the Oxford and Southampton A. M. C.'s, the Directors, in accordance therewith, sent return-sheets to every district, to be by them forwarded to lodges, and the same have been duly completed and returned back to them, and form the first means ever taken by the Manchester Unity to ascertain the amount of sickness and mortality experienced by the Order. In going through such returns, I am of opinion that every attention has been paid to forward them as correct as possible ; and having an opportunity, when calling upon Districts to fill up the returns for the lists of lodges, to call upon them to give me the age and number of deaths that had occurred during the same year, I availed myself of that opportunity of doing so, and these returns having been collected from different and independent sources, and perfectly agreeing with the returns received from lodges, is a sufficient proof, if any was required, of the correctness of such returns.

The following gives a succinct view of the data from which results in these Contributions, and also those of the Odd Fellow Societies are derived :—

TABLE Z.

| Age.      | SICKNESS FOR QUINQUENNIAL TERMS OF LIFE ACCORDING TO                          |            |                                |                    |            |                                | Age.      |
|-----------|-------------------------------------------------------------------------------|------------|--------------------------------|--------------------|------------|--------------------------------|-----------|
|           | DATA FOR ENGLAND,<br><i>According to "Contributions to Vital Statistics."</i> |            |                                | ODD FELLOWS' DATA. |            |                                |           |
|           | Population.                                                                   | Sickness.  | Average<br>Sickness<br>Yearly. | Population.        | Sickness.  | Average<br>Sickness<br>Yearly. |           |
| 21 to 25  | 106743                                                                        | 91419·850  | ·8564                          | 95222              | 67095·278  | ·7046                          | 21 to 25  |
| 26 ... 30 | 170241                                                                        | 153465·139 | ·9014                          | 153133             | 117185·709 | ·7652                          | 26 ... 30 |
| 31 ... 35 | 188030                                                                        | 173893·855 | ·9248                          | 138355             | 119097·563 | ·8607                          | 31 ... 35 |
| 36 ... 40 | 177441                                                                        | 190179·711 | 1·0718                         | 109238             | 106872·707 | ·9783                          | 36 ... 40 |
| 41 ... 45 | 142411                                                                        | 191443·567 | 1·3443                         | 58483              | 71784·849  | 1·2274                         | 41 ... 45 |
| 46 ... 50 | 114085                                                                        | 195891·714 | 1·7185                         | 33878              | 55048·706  | 1·6249                         | 46 ... 50 |
| 51 ... 55 | 81131                                                                         | 188482·281 | 2·3231                         | 12632              | 27738·852  | 2·1959                         | 51 ... 55 |
| 56 ... 60 | 57126                                                                         | 187222·283 | 3·2773                         | 5120               | 17837·850  | 3·4839                         | 56 ... 60 |
| 61 ... 65 | 34173                                                                         | 187894·567 | 5·4983                         | 1871               | 10787·422  | 5·7655                         | 61 ... 65 |
| 66 ... 70 | 21655                                                                         | 240976·141 | 11·1279                        | 700                | 4848·564   | 6·9265                         | 66 ... 70 |
| 71 ... 75 | 11420                                                                         | 210195·995 | 18·4056                        | 206                | 2790·567   | 13·5464                        | 71 ... 75 |
| 76 ... 80 | 5626                                                                          | 146594·853 | 26·0566                        | 63                 | 1041·708   | 16·5349                        | 76 ... 80 |
| 81 ... 85 | 2002                                                                          | 56589·711  | 28·2665                        | 24                 | 600·855    | 25·0356                        | 81 ... 85 |

It will be observed in the above figures that the rate of sickness at the earlier and more advanced periods of life is less, according to the experience of Odd Fellow Societies ; in the middle period of life the difference is very little ; and in the ten years, 56–65, the rate of sickness is higher than that given in these Contributions : and in reference to the differences existing between the two classes of results at the younger and older ages, there is a sufficient explanation to shew that they are due to accidental causes, and do not constitute any essential feature of difference depending on physical or social conditions peculiar to either class of results. An inspection of column 5 preceding, will shew that in the data connected with the Odd Fellow experience the numbers under observation after



the age of 65, are much too limited to admit of any results derived therefrom being safely relied on. In the term of life 66-70, the whole experience is confined to 700 years of life, or observations on about 233 members for a term of three years. Again, in the next quinquennium, the experience is limited to about 69 members only for the same period; and in the decennial term following, the whole experience does not embrace more than about 29 members—numbers obviously so small that it is impossible to place any reliance on the results. On the other hand, the data from which the results of these Contributions are derived for the corresponding terms of life are upwards of forty times the magnitude. It is therefore very much to be regretted that Mr. Ratcliffe should have allowed so very inadequate data to enter into any of the monetary Tables representing the contributions to provide sickness for the whole of life; or should have employed his data even beyond the age of 65, as the monetary expressions are those most likely to be questioned and reasoned upon by the members, who may thereby be led into serious errors. Beyond the age of 65, Mr. Ansell's data included only 373 years of life; but he did not carry his monetary Tables above the age of 70, and even up to that age he adopted sufficient means of correcting any irregularities likely to arise from the limited numbers immediately preceding that period of life.

There is another feature in the Odd Fellow results for ages under 35 or 40, which requires observation. The Manchester Unity of Odd Fellows, is under its present gigantic numbers, of but recent and of most rapid growth. In the year 1834, the number of members was about 60,000, and in the beginning of the year 1846, the time to which the data now collected relates, the number of members was 251,727, being an increase during the twelve years of about 19,000 yearly; but in consequence of the dismissions from the Unity, the number of new members has been much greater. The Directors say, in one of their Reports, that "The amount of initiation money which was received from members in 1844, being no less a sum than £49,382, it will be discovered, on reference to the list of lodges, that our increase of members in that year was only 21,461, and by these returns it is clearly proved that upwards of 40,000 members were initiated in 1844; thereby at once affirming, that upwards of 20,000 members left the Order in one year." Keeping in view, therefore, the immense influx of young members into the Unity, with the fact that the great bulk of them is under the age of 35, the average age of all the members being at the period to which the data in Table VII relates, about 33 years, it is obvious that at the younger ages, so long as such a mutation in the list of the members goes on, there must be recorded in the books of the society, and markedly so at the younger ages, a much less amount of sickness than the very same persons would be subject to under the usual quiet and permanence of the members of friendly societies in general. This remarkable fluctuation in the body of members of the Order, occasioned by the very extraordinary number of withdrawals, and the still more extraordinary augmentation of the numbers again by the admission of new members, although



greatly to be regretted, as depriving the Institution of what, under happier circumstances, would be its greatest recommendation, that of cultivating among its members settled habits of prudence and forethought, is, nevertheless, so long as such disturbing causes exist, calculated to reduce its liabilities very materially, and especially, recruiting the ranks with healthy and vigorous members, at the younger ages, will shew at these terms of life, a diminished ratio of sickness. However, after the age of 35 or 40, the effect of this selection or influence will not be so visible, if it does not entirely disappear. A striking illustration of this is observable, by comparing the results of the Odd Fellows, and of the data in these Contributions between the ages of 40 and 65, in which the coincidences of the two rates of sickness is certainly remarkable, considering the very different sources of the data, and the different circumstances under which they were collected.

TABLE AA.

| From Age. | Amount of Sickness experienced in passing through the following terms of life, expressed in weeks, according to the results of |                                      |                      |
|-----------|--------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------|
|           | The "Unity."                                                                                                                   | "Contributions to Vital Statistics." | Difference per Cent. |
| 60 to 65  | 27·2239                                                                                                                        | 27·0894                              | — 0·49               |
| 50 ... 60 | 26·1073                                                                                                                        | 26·6338                              | + 1·97               |
| 50 ... 65 | 53·3312                                                                                                                        | 53·7232                              | + 0·72               |
| 45 ... 65 | 61·1277                                                                                                                        | 62·0334                              | + 1·46               |
| 40 ... 65 | 67·0746                                                                                                                        | 68·5131                              | + 2·08               |

The preceding Table will suffice to convey a general idea of the results now given to the public by Mr. Ratcliffe, and their relation to those of preceding inquiries. In his interesting volume there are many subjects of importance treated, but there is only space for a very few further remarks, connected with sickness peculiar to different occupations. The results are given for 26 different trades, but the number under observation in the majority of groups is so small, that it is surprising Mr. Ratcliffe should have thought so limited data of importance enough to induce him to calculate an independent series of results for each. The following are the only groups of sufficient magnitude to deserve attention:—

| Occupation.                            | Aggregate amount of sickness experienced in passing through the following periods of life. |                    |
|----------------------------------------|--------------------------------------------------------------------------------------------|--------------------|
|                                        | From Age 30 to 40.                                                                         | From Age 40 to 50. |
| Blacksmiths . . . . .                  | 8·5676                                                                                     | 13·2624            |
| Bricklayers, Plasterers, and Slaters . | 8·8554                                                                                     | 12·8471            |
| Carpenters . . . . .                   | 9·0781                                                                                     | 10·8080            |
| Agricultural Labourers . . . . .       | 10·1360                                                                                    | 14·1457            |
| Town and City Labourers . . . . .      | 10·7897                                                                                    | 14·9163            |
| Mill Operatives . . . . .              | 7·2435                                                                                     | 12·0533            |
| Miners . . . . .                       | 15·6215                                                                                    | 25·5730            |
| Plumbers, Painters, and Glaziers . .   | 8·6707                                                                                     | 17·7194            |
| Servants . . . . .                     | 7·5761                                                                                     | 10·4663            |
| Shoemakers . . . . .                   | 8·0200                                                                                     | 12·0715            |
| Spinners . . . . .                     | 9·4789                                                                                     | 18·4460            |
| Stonemasons . . . . .                  | 11·2959                                                                                    | 16·4316            |
| Tailors . . . . .                      | 9·6825                                                                                     | 12·0638            |
| Weavers . . . . .                      | 10·5768                                                                                    | 13·9304            |



The preceding figures are sufficient to shew the remarkable influence of particular occupations on the amount of sickness; but the difference shewn by the above results is evidently, to some extent due to the fluctuation of small numbers, and cannot be taken as a true criterion of the sanitary condition of the different trades. Still, there can be no doubt but that occupation is a most important element, and should be kept closely in view by those connected with the formation and management of friendly societies. The neglect of this important consideration in the establishment of these provident associations, and the application of average results only, has frequently been the cause of their ruin.

Mr. Ratcliffe, at page 36 of his publication, has the following important remark on this subject. "It must be apparent that these lives will be existing under very different circumstances, and be affected by a different combination of trades. Mr. Neison's agricultural labourers form 33 per cent., and in the experience here given they form only 20 per cent. of the rural class; and if a larger per centage of similar trades, experiencing more than the average sickness, be combined in one more than in the other class, there will appear more average sickness existing in the first than in the other class, from not having that large per centage of those trades,—other circumstances being similar." Also, "in addition to being affected by a different combination of trades, the average sickness will vary according to locality. The persons resident in Glasgow and Liverpool, for example, experience such an average amount of sickness that, by being included in the City Districts, the bulk shews an excess of aggregate sickness (between the ages of 20–70) of 9·4416 weeks over the same class of Mr. Neison's; but, by being abstracted, the remaining portion shews a much less aggregate sickness than the one just named."

These observations prove how very needful it is to be careful in drawing conclusions from isolated observations; and that on nothing but extended experience, carefully analysed with a strict regard to all the circumstances connected with the data, can any reliance be placed. The results now submitted to the public as the experience of the "Manchester Unity of the Independent Order of Odd Fellows," can only as yet be regarded as an approximation to what, under a more settled and permanent state of the Institution, will be the average rate of sickness; and it would be only prudent for the directors and others taking an active part in its affairs, not to discard other data, but to regard their own more as an indication of the features peculiar to themselves, than as an ample and satisfactory body of facts by which they should be implicitly guided.

From the results now presented in connection with the working of the Order itself, it is plain that there exists no better foundation on which the members can base their calculations than the data and facts given in these Contributions; as the practical experience of the Unity is not only a confirmation of the laws of sickness and mortality herein developed, but almost an actual assimilation with them, and, so far as practical legislation is concerned, one might be used for the other. Admitting this, it will hence



follow, that the money tests hereafter given and derived from the data in these Contributions are equally applicable to the guidance of the Order of Odd Fellows; and any one objecting to a proposition to establish the Institution on a rate of contributions equivalent to the results of those data, must carry his objections much further, and object to the data themselves; but as it has been shewn that to object to the data would be to deny the experience of the Order, no such objections can be raised, and therefore the money tests and values to be hereafter presented will remain indisputable.

Another element to be kept in view while considering this question, is the influence of time in producing an average result. It might happen that a particular society or district may experience a reduced or an increased amount of sickness in a particular year; but were the observations extended over several years, the deficiency of one would be compensated by the excess of another year. More striking illustrations of this can be shewn in connection with the law of mortality. Even very large populations, such as the population of Glasgow, are subject to remarkable fluctuations, shewing an extreme difference in some years of about 68 per cent., or a mean fluctuation of about 32 per cent. An inspection of the total male deaths for all ages, for each of the ten years 1832-41 will render this evident.

|                         |      |                         |      |
|-------------------------|------|-------------------------|------|
| Total Deaths in 1832... | 4811 | Total Deaths in 1837... | 5423 |
| ... 1833...             | 3229 | ... 1838...             | 3490 |
| ... 1834...             | 3255 | ... 1839...             | 3898 |
| ... 1835...             | 3726 | ... 1840...             | 4470 |
| ... 1836...             | 4334 | ... 1841...             | 4514 |

It will further be seen, that those remarkable fluctuations are due chiefly to the mortality in mature life, and not to the mortality in infancy, as some writers have believed.

| Year.       | From 20 to 50. | In the First Year of Life. | Year.       | From 20 to 50. | In the First Year of Life. |
|-------------|----------------|----------------------------|-------------|----------------|----------------------------|
| In 1832 ... | 1795           | ... 332                    | In 1837 ... | 1991           | ... 371                    |
| 1833 ...    | 902            | ... 306                    | 1838 ...    | 1010           | ... 336                    |
| 1834 ...    | 923            | ... 313                    | 1839 ...    | 966            | ... 318                    |
| 1835 ...    | 885            | ... 365                    | 1840 ...    | 1346           | ... 404                    |
| 1836 ...    | 1279           | ... 315                    | 1841 ...    | 1278           | ... 381                    |

It appears, then, that while the extreme difference in the mortality from ages 20 to 50 is 125 per cent., for the first year of life it is only 32 per cent. If the mean fluctuation for ages 20 to 50 be taken, it will be found to be 53 per cent., while that for the first year of life is only 14 per cent. Were the inspection extended to the mortality of female life, similar results would be obtained. Notwithstanding the inferior numbers in infant life, the fluctuation is confined within narrower limits than the mortality of mature life; and this fact is in accordance with the doctrine of probability when applied to any other subject,



as well as to the mortality of life. For whenever the intensity which determines any result increases—or in other words, when the probability of any event approaches unity—so also will the fluctuation in a series of events be reduced in amount.

The folly of relying on limited observations for the guidance of any individual society or lodge, may be further proved by referring to pp. 417–20 *ante*, as well as from further illustrations to be hereafter given, in which it is shewn that the sickness in some trades differs widely; and when numbers are small, there must, of necessity, be also peculiarity of employment, and consequently a peculiar series of results. The same principle is disclosed by the facts set forth in the Abstract at p. 426 preceding, and in Appendix A of the Report by Lord Beaumont's Committee, Session 1847–8, Paper No. 126, which should be most carefully studied by those connected with the practical management of friendly societies. The following facts are also curious, and deserve the closest attention. In a Report made by Mr. Yeats in 1847, on the affairs of a friendly society in Aberdeen, the following statements are found:—

| Age.      | Number of Free Members on the Fund, from Oct. 1832, to Oct. 1846. | Years of Life during which the Society was liable for Sickness Allowances. | Amount of Sickness expected for the time during which the Society was liable. | Amount of Sickness actually experienced. (Seven days per week.) |
|-----------|-------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------|
|           |                                                                   | Yrs. Qrs.                                                                  | Weeks.                                                                        | Weeks. Days.                                                    |
| Under 21  | 7                                                                 | 13 3                                                                       | 9·887                                                                         | 16 3                                                            |
| 21 ... 25 | 59                                                                | 113 2                                                                      | 82·316                                                                        | 47 1                                                            |
| 26 ... 30 | 95                                                                | 213 2                                                                      | 162·440                                                                       | 159 0                                                           |
| 31 ... 35 | 94                                                                | 225 1                                                                      | 182·863                                                                       | 303 1                                                           |
| 36 ... 40 | 76                                                                | 208 3                                                                      | 187·166                                                                       | 183 3                                                           |
| 41 ... 45 | 38                                                                | 110 0                                                                      | 116·591                                                                       | 257 1                                                           |
| 46 ... 50 | 14                                                                | 40 3                                                                       | 59·433                                                                        | 91 0                                                            |
| 51 ... 55 | 16                                                                | 15 1                                                                       | 31·261                                                                        | 8 6                                                             |
| 56 ... 60 | 1                                                                 | 4 0                                                                        | 10·360                                                                        | 0 0                                                             |
| Totals .  | 400                                                               | 944 3                                                                      | 842·317                                                                       | 1066 1                                                          |

“ From the above it will be seen, that the actual experience of sickness has considerably exceeded the expected amount. The excess is 20·994 per cent.”

“ The excess of the actual experience of the society, above the Table in the Highland Society's Report, is 36·795 per cent.; the total amount of sickness according to which would have been only 673·854 weeks.”

“ The latest published Table of the Rate of Sickness in Scotland is that contained in ‘Contributions to Vital Statistics,’ by F. G. P. Neison, Table V. The amount of sickness, according to that Table, would have been 885·202 weeks, so that the experience of the society exceeds that in Neison's Table by 16·034 per cent.”

“ The experience of the society is indeed on a limited basis, embracing only 400 members, who have collectively been exposed to the risk during 944 years of life, and no



certain conclusion can be drawn from it; but the fact of there being an excess so considerable in amount, taken in connection with the fact, that wherever accurate observations have been made, the same tendency has always been manifested, ought to lead to watchful care and caution."

"The following Table shews, (1), The average time in each period of five years during which each member was entitled to Sick Benefit; (2), The amount of sickness which he was expected to experience, according to the data on which the contributions were calculated; and, (3), The average amount of sickness actually experienced by the members during each period:—

TABLE BB.

| Age.      | Average No. Years of Life in each quinquennium during which the Society was liable to each member. | Average amount of sickness expected for each member during the preceding period. | Average amount of sickness to each member actually experienced during each period. |
|-----------|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|           | Years.                                                                                             | Weeks.                                                                           | Weeks.                                                                             |
| Under 21  | 1·964                                                                                              | 1·412                                                                            | 2·347                                                                              |
| 21 to 25  | 1·924                                                                                              | 1·395                                                                            | 0·799                                                                              |
| 26 ... 30 | 2·247                                                                                              | 1·710                                                                            | 1·674                                                                              |
| 31 ... 35 | 2·396                                                                                              | 1·945                                                                            | 3·225                                                                              |
| 36 ... 40 | 2·747                                                                                              | 2·463                                                                            | 2·414                                                                              |
| 41 ... 45 | 2·896                                                                                              | 3·068                                                                            | 6·767                                                                              |
| 46 ... 50 | 2·911                                                                                              | 4·245                                                                            | 6·500                                                                              |
| 51 ... 55 | 2·583                                                                                              | 5·210                                                                            | 1·433                                                                              |
| 56 ... 60 | 4·000                                                                                              | 10·360                                                                           | ...                                                                                |

Again, at p. 29 of the Report made by the Second Quinquennial Committee of the Glasgow Thistle and Rose Society, in the year 1841, columns 2 and 4 of the following Table are found.

TABLE CC.

*Average Yearly Sickness and Mortality in the Thistle and Rose Society, from December 1810 to December 1840.*

| Age.      | Sickness experienced in   |                                               | Mortality experienced in  |                                               |
|-----------|---------------------------|-----------------------------------------------|---------------------------|-----------------------------------------------|
|           | Thistle and Rose Society. | Friendly Societies, England & Wales. Table E. | Thistle and Rose Society. | Whole Population of England & Wales. Table C. |
| 25 to 30  | ·2178                     | ·9014                                         |                           |                                               |
| 30 ... 35 | ·6850                     | ·9248                                         | 2·4650                    | 1·063                                         |
| 35 ... 40 | ·6467                     | 1·0718                                        | 1·4550                    | 1·157                                         |
| 40 ... 45 | 1·1930                    | 1·3443                                        | 1·4779                    | 1·319                                         |
| 45 ... 50 | 1·9702                    | 1·7185                                        | 2·0685                    | 1·560                                         |
| 50 ... 55 | 1·7951                    | 2·3231                                        | 3·5256                    | 1·935                                         |
| 55 ... 60 | 2·9619                    | 3·2773                                        | 3·3333                    | 2·529                                         |
| 60 ... 65 | ·5357                     | 5·4983                                        |                           |                                               |



In regard to sickness, the following shews the average ratio per annum to each member, according to the actual experience of the Aberdeen Society, the Thistle and Rose Society, and the average for friendly societies in England and Wales, Table E, pp. 26-27 *ante*.

TABLE DD.

| Age.      | Average Sickness yearly to each Member, expressed in weeks, according to the experience of the |                   |                                                   |
|-----------|------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------|
|           | Thistle and Rose Society.                                                                      | Aberdeen Society. | Friendly Societies in England and Wales. Table E. |
| 25 to 30  | ·2178                                                                                          | ·742              | ·9014                                             |
| 30 ... 35 | ·6850                                                                                          | 1·346             | ·9248                                             |
| 35 ... 40 | ·6467                                                                                          | ·879              | 1·0718                                            |
| 40 ... 45 | 1·1930                                                                                         | 2·337             | 1·3443                                            |
| 45 ... 50 | 1·9702                                                                                         | 2·233             | 1·7185                                            |
| 50 ... 55 | 1·7951                                                                                         | ·555              | 2·3231                                            |

It is hence obvious that, although the members of the Thistle and Rose Society are resident chiefly in the City of Glasgow, they are subject to a remarkably low rate of sickness, while, according to the results for the Aberdeen Society, the rate of sickness is even higher than that for England and Wales by 16 per cent. It will also be observed that there is a striking illustration in the Thistle and Rose Society of a high rate of mortality, and a very low rate of sickness, while in the friendly societies of England and Wales the sickness is much higher, and the mortality lower. If reference be now made to the facts given in Mr. Ratcliffe's analysis of the Odd Fellow Sickness, he will be found to state, at p. 36, that "In addition to being affected by a different combination of trades, the average sickness will vary according to locality; the persons resident in Glasgow and Liverpool, for example, experience such an average amount of sickness, that, by being included in the City Districts, the bulk shews an excess of aggregate sickness of 9·4416 weeks over the same class of Mr. Neison's, but, by being abstracted, the remaining portion shews a much less aggregate sickness than the one just named," but, at p. 135 of his work, the results of the sickness for the Odd Fellow Lodges in Glasgow are furnished, and in the following Abstract the amount of sickness will be found contrasted with the results for the Thistle and Rose Society in the above city:—

TABLE EE.

| Age.      | Amount of Sickness experienced in passing through the following periods of life, according to |                                    |                                                         |
|-----------|-----------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------|
|           | Odd Fellow Societies, Glasgow.                                                                | Thistle and Rose Society, Glasgow. | Excess per Cent. of Odd Fellow Society above the other. |
| 20 to 30  | 8·9107                                                                                        | 6·847                              | 30·140                                                  |
| 30 ... 40 | 14·3855                                                                                       | 6·421                              | 125·284                                                 |
| 40 ... 50 | 23·6009                                                                                       | 16·135                             | 46·272                                                  |
| 20 ... 50 | 46·8971                                                                                       | 29·403                             | 59·498                                                  |



The preceding results are certainly most curious, and cannot fail to occasion to those who seriously consider and study the subject, many important and interesting reflections on the state and condition of friendly societies. After a careful examination of the preceding facts, it will immediately appear to every intelligent observer, how very difficult must be the task of advising friendly societies and Odd Fellows lodges on the graduation of the scales to be adopted, under the peculiar circumstances of each lodge or society. It has always been a difficult matter to contend against the disposition which has long existed for the adoption of a uniform scale for all societies indiscriminately; even the two recent Committees of the Houses of Parliament have shewn a strong tendency in that direction, and nothing short of the production of the most striking examples of the failures and dangers of such a course could have prevented the adoption of model Tables, to be used as applicable under all circumstances. It is, however, now abundantly evident, that the circumstances under which different societies are placed, are of such a nature as to cause the most striking differences in their liabilities, and it is only a close and laborious study of the subject, which will qualify any one to give advice to the managers of them on the questions of most vital importance to their stability and permanency. The facts given by Mr. Ratcliffe for the Odd Fellows lodges in the City of Glasgow, do not extend beyond the age of 50, and, therefore, the comparison between them and the results of the Thistle and Rose Society, must be limited to that age; but so far as respects the rate of sickness in the Thistle and Rose Society itself, there is a curious circumstance, which it is important to describe for the benefit of those connected with the management of sick clubs, as proving how many causes affect the prosperity and liabilities of these societies, and how essential it is that all those elements should be well understood, before pronouncing on their state or condition. The following shews the amount of sickness experienced in passing through different periods of life, deduced from the actual experience of the society, from the year 1810 to 1848, contrasted with the results of friendly societies in England and Wales generally, as given in Table V, p. 409 *ante*.

TABLE FF.

| Age.      | Amount of Sickness experienced in passing through each period of life. |                           |                                                                   |
|-----------|------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------|
|           | England and Wales.                                                     | Thistle and Rose Society. | Difference of Sickness per Cent. in the Thistle and Rose Society. |
| 20 to 30  | 8.7145                                                                 | 6.8468                    | — 27.278                                                          |
| 25 ... 35 | 9.2123                                                                 | 7.9468                    | — 13.408                                                          |
| 30 ... 40 | 9.9120                                                                 | 6.4205                    | — 54.380                                                          |
| 35 ... 45 | 11.7519                                                                | 9.8710                    | — 19.055                                                          |
| 40 ... 50 | 14.7999                                                                | 16.1349                   | + 8.274                                                           |
| 45 ... 55 | 19.4607                                                                | 25.8203                   | + 24.630                                                          |
| 50 ... 60 | 27.0894                                                                | 41.7634                   | + 35.136                                                          |
| 55 ... 65 | 42.5727                                                                | 56.5032                   | + 24.654                                                          |
| 60 ... 70 | 77.3029                                                                | 107.0837                  | + 27.811                                                          |
| 20 ... 55 | 44.5769                                                                | 45.5842                   | + 2.210                                                           |
| 55 ... 70 | 93.2418                                                                | 132.6651                  | + 29.716                                                          |
| 20 ... 70 | 137.8187                                                               | 178.2493                  | + 22.682                                                          |



There is here a very remarkable feature disclosed in the rate of sickness by which the above society is influenced; in each term of life under 40, the rate is uniformly and very largely under that for England and Wales, but above that age the difference is in the opposite direction. The sickness between ages 20–40, in England and Wales, exceeds that of the Thistle and Rose Society by 40·4 per cent., but from ages 40–70 falls short of it by 28·2 per cent. Again, between ages 20–55 the aggregate sickness differs by 2·2 per cent., but in the 15 years 55–70, the excess of sickness in the Thistle and Rose Society is about 30 per cent., and over the whole term of fifty years 20–70 the excess of sickness is 22·682 per cent. Hence, although the aggregate sickness in this society exceeds that of the average of societies in England and Wales, it is obvious that rates or scales of contributions and benefits, graduated according to the data for the kingdom at large, would be quite unsuited for this society or for any other, subject to a like peculiarity in the law of sickness. The greatest care and judgment are therefore necessary to discriminate the nature and extent of the sickness to which societies are subject. General results can only be useful for general purposes, but may lead to the most disastrous consequences if applied indiscriminately to individual societies. In some documents recently received from Dr. Watt, of Glasgow, relative to this society, the following figures are found:—

“Amount of sickness experienced by the society from the 1st of December, 1830, to the 1st of December, 1848, among all the members, between the ages of 19–70, and embracing 4279·25 years of life, compared with the sickness which would have been experienced according to the rates of other Tables.”

|                                                                 |                |
|-----------------------------------------------------------------|----------------|
| “Actual experience of the Society . . . . .                     | = 7214 weeks.  |
| Mr. Neison’s (Rural, Town and City Districts—England) . . . . . | = 7398 weeks.  |
| Town Districts . . . . .                                        | = 7694 weeks.  |
| Mr. Ansell’s Tables . . . . .                                   | = 6000 weeks.  |
| Highland Society’s Tables . . . . .                             | = 4429 weeks.  |
| Dr. Price’s Hypothesis . . . . .                                | = 5959 weeks.” |

It has already been stated that the mortality in this society has been remarkably high, compared to the amount of sickness; and what is deserving of observation, is the fact, that while the sickness under the age of 40, is 40·4 per cent. under the ratio for England and Wales, still the mortality at the same term of life is upwards of 35 per cent. above that of England and Wales.

The following are the results of the mortality:—

|                                                              | From age 28-44. | From age 45-70. | Total. |
|--------------------------------------------------------------|-----------------|-----------------|--------|
| Actual experience of the society from 1830–48 . . . . .      | 42              | + 46            | = 88   |
| Expected Mortality according to Mr. Ansell’s Table . . . . . | 39              | + 39            | = 78   |
| ... Northampton do. . . . .                                  | 54              | + 45            | = 98   |
| ... Carlisle do. . . . .                                     | 31              | + 27            | = 58   |



The affairs of this society appear to be managed with great skill and judgment, and although it cannot, either in respect to the number of its members, or the amount of its funds, be considered of equal importance to many societies in England, there is no society south of the Tweed conducted with more intelligence, nor furnishing more useful and valuable annual reports, which appear to be quite models for imitation by other societies.

In 1848, a very interesting report was made by Mr. Ansell, on the state of a large friendly society, established in an agricultural county in the East of England. The history and circumstances connected with this society are remarkable, and calculated to throw considerable light on the causes which frequently lead to the dissolution of provident institutions, shewing in a striking manner the danger of estimating from average results the liabilities of individual societies, even when established on an extensive scale. The following letter, received from the secretary of the society in 1843, describes in a brief manner its history, as well as the writer's views on the liabilities of friendly societies, prior to the publication of "Contributions to Vital Statistics."

*Provident Society's Office, Chelmsford,*  
31st October, 1843.

SIR,

Remarking on the state of friendly societies—Enclosed I hand you a copy of the Rules, and the 25th Report of the Chelmsford and Essex Provident Society.

I had the honour of being associated with the Rev. R. G. Baker, at that time Curate of Springfield, but at present Rector of Fulham, in the establishment of this institution, and which I have conducted for more than a quarter of a century, during which time I have watched with no little care and anxiety its eventful progress.

When first contemplated, it was intended to limit it to Springfield, a rural parish, adjoining the Town of Chelmsford; this idea was abandoned, and it was finally determined that it should include a circle of four miles round the Shire Hall, making the Shire Hall the centre, or turning point.

Four years afterwards, the boundary was extended to seven miles round the Shire Hall, and, in the ninth year, the boundary wall was thrown down, and it now occupies the greater part of the county, having nineteen districts, besides the home district. It has between three and four hundred honorary members, and upwards of 5500 subscribing members, and a capital of £.25,000 nearly.

The business of the society was, however, conducted in Springfield more than twenty years, until it had fairly outgrown the accommodation there afforded. A more eligible situation offering itself, it was removed from Springfield into the town of Chelmsford.

I have not time to make any lengthened observations on the subject of friendly societies, but this much I venture to assert, that very little is known, or can be learnt of the actual rate of sickness experienced by members of friendly societies, because so very little attention has hitherto been paid to the subject.

Conducted as friendly societies mostly are, at a public house, where the business of the ill-paid clerk is to collect the monthly payments—to keep a sort of beer-score account thereof—to smoke his pipe,—drink his quart of beer,—lock up his book in the formidable box "with three locks and three



keys," until the following month, and then his labours end, without his giving the society's real interest a passing thought during the interval.

Then again the stewards, What are they? or what knowledge do they possess? Changed every three months, they know less, if possible, than the clerk: the office being generally filled by the poorer, and, consequently, more illiterate members, oftentimes not able to read their own names. This happens because they are chosen by *rotation*: the more intelligent members pay the fine rather than fill the office, consequently, the duties fall on the most incompetent.

Under these circumstances, and with such materials, it is no wonder that actuaries should come to wrong conclusions on the subject, and must do so until they have some data on which they can confidently rely.

So far as the County of Essex is concerned, I do not hesitate to say, that the calculations of the Highland Society are very much below the actual rate of sickness experienced by this society, and so are Mr. Ansell's;—I allude to sickness in early life.

There appears to me to be a great mistake in representing sickness, like a flight of steps, or Jacob's Ladder; judging from actual experience, I conclude that young persons have more sickness than actuaries give them credit for.

I have for eighteen years been engaged in collecting the experience of this society, as to the actual amount of sickness amongst the members of the different ages, and should I be spared to continue it for twelve years longer, I think it will make a good almanack for the County of Essex.

By making this new inquiry in Scotland\*, I presume that time has told the tale in that country, that the calculations of the Highland Society are too low.

A series of reports I am not able to furnish you with, I merely retain a copy for my own use.

I thank you for the papers sent; accept my best wishes for success in your present undertaking.

Yours, truly,

JOHN BASSINGWHITE.

To F. G. P. NEISON.

There can be no doubt that Mr. Bassingwhite has been a close observer of the progress of the society, and that, with one exception, his opinions may be regarded as founded on fact. The remarks about "Jacob's Ladder" only shew how very difficult it is for even those in the closest relations with the practical working or progress of a provident society, to judge with anything like accuracy of some of the most important elements of its liabilities; for, from the records of this same society, it will be found that sickness does actually increase in its intensity with the increase of age, following the law so well established by other results. But certainly, the amount of sickness experienced by the members is very high, and a consideration of the following results deduced from the report already referred to, is well calculated to shew, not only to Odd Fellows, but to friendly societies in general, the necessity of carefully viewing all the elements likely to affect their interests, and to prevent them from placing confidence in either isolated observations or aggregated general results:—

\* Alluding to the prizes offered by the Author for the best returns from friendly societies.



TABLE GG.

*Sickness experienced by the Male Members of the "Essex Provident Society,"  
from its foundation in 1818, till the year 1847.*

| Age.      | Number of Years<br>in which Members<br>were exposed to<br>risk of Sickness. | Sickness.                                |                                   | Average Sickness<br>according to<br>"Contributions,"<br>for Eng. & Wales. | Excess of Sickness in the Essex<br>Society, over England and Wales. |                         |
|-----------|-----------------------------------------------------------------------------|------------------------------------------|-----------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------|-------------------------|
|           |                                                                             | Gross amount<br>experienced<br>in weeks. | Average Yearly<br>to each Member. |                                                                           | Difference.                                                         | Difference<br>per Cent. |
| 14 to 20  | 4926.50                                                                     | 5845.354                                 | 1.187                             | ...                                                                       | ...                                                                 | ...                     |
| 21 ... 25 | 9478.25                                                                     | 12234.286                                | 1.291                             | .8564                                                                     | + .4346                                                             | + 50.75                 |
| 26 ... 30 | 9464.50                                                                     | 12734.858                                | 1.346                             | .9014                                                                     | + .4446                                                             | + 49.32                 |
| 31 ... 35 | 7481.00                                                                     | 10765.571                                | 1.439                             | .9248                                                                     | + .5142                                                             | + 55.60                 |
| 36 ... 40 | 5494.75                                                                     | 8430.001                                 | 1.534                             | 1.0718                                                                    | + .4622                                                             | + 43.12                 |
| 41 ... 45 | 3941.25                                                                     | 6747.428                                 | 1.712                             | 1.3443                                                                    | + .3677                                                             | + 27.35                 |
| 46 ... 50 | 2783.00                                                                     | 5067.143                                 | 1.821                             | 1.7185                                                                    | + .1025                                                             | + 5.96                  |
| 51 ... 55 | 1413.50                                                                     | 4564.144                                 | 3.229                             | 2.3231                                                                    | + .9059                                                             | + 39.00                 |
| 56 ... 60 | 399.50                                                                      | 1945.286                                 | 4.869                             | 3.2773                                                                    | + 1.5917                                                            | + 48.57                 |
| 61 ... 65 | 120.50                                                                      | 497.143                                  | 4.126                             | 5.4983                                                                    | - 1.3723                                                            | - 24.96                 |
| 66 ... 70 | 32.00                                                                       | 510.999                                  | 15.969                            | 11.1279                                                                   | + 4.8411                                                            | + 43.50                 |
| 71 ... 72 | 2.50                                                                        | 21.286                                   | 8.514                             | ...                                                                       | ...                                                                 | ...                     |
| Total . . | 45537.25                                                                    | 69353.499                                | 1.501                             | ...                                                                       | ...                                                                 | ...                     |

From the preceding letter it will be observed that in 1843 the society had 5500 subscribing members; but at the period at which the above observations close, there were 6146 members, while the gross number of years of life to which members were exposed to the risk of sickness was no less than 45537.25 years, consequently, as the data have been collected from the experience of twenty years, the results may be considered to fairly represent the liabilities of any friendly society, the members of which are similarly circumstanced to those in the Rural Districts of Essex. The rate of sickness, it will be seen, exceeds that of friendly societies generally in England and Wales, by upwards of 40 per cent. If, therefore, in constructing Tables for such a society, or in estimating its liabilities, an actuary were to be guided by the rate for the whole kingdom, or for any one of the districts set forth in these Contributions, or in the similar districts of the Odd Fellow results recently published by the Unity, it is obvious that a most fatal error would be committed. The greatest care and judgment are consequently required, both in establishing friendly societies, and in remodelling existing ones, to ascertain the precise rate of sickness peculiar to the circumstances of the case, as nothing could be more fallacious and contrary to all experience and correct observation, than the application of a general rate of sickness indiscriminately to all societies. It is therefore to be lamented that in the present advanced state of the laws of sickness, some authorities should still, without distinction, issue to societies who may apply to them for advice, the same stereotyped set of printed Tables, whatever may be the circumstances in which they are placed.

As already stated, Appendix A of Lord Beaumont's Committee, Session 1847-8, paper No. 126, will be found to contain some remarkable examples of the different rates of



sickness to which societies are subject, but an interesting contrast to the results of the Essex Provident Society will be found in the experience of the Wilts Friendly Society. They resemble each other very much in respect to the rural character of the districts over which the two societies are distributed, but in the ratio of sickness experienced by them the difference is very great. Both societies were established in the same year, 1828,—both societies are widely spread over districts almost purely agricultural, and both societies contain a large number of members. The following shews the rate of sickness experienced by the male members of each society:—

TABLE HH.

| Age.      | Rate of Sickness expressed in weeks,<br>experienced by |                |                      |
|-----------|--------------------------------------------------------|----------------|----------------------|
|           | Essex Society.                                         | Wilts Society. | Difference per cent. |
| 21 to 25  | 1.291                                                  | 0.743          | 72.409               |
| 26 ... 30 | 1.346                                                  | 1.071          | 25.677               |
| 31 ... 35 | 1.439                                                  | 0.929          | 54.897               |
| 36 ... 40 | 1.534                                                  | 0.743          | 106.461              |
| 41 ... 45 | 1.712                                                  | 0.486          | 252.263              |
| 46 ... 50 | 1.821                                                  | 0.600          | 203.500              |
| 51 ... 55 | 3.229                                                  | 0.843          | 283.036              |
| 56 ... 60 | 4.869                                                  | 0.771          | 531.518              |
| 61 ... 65 | 4.126                                                  | 1.929          | 113.893              |
| 66 ... 70 | 15.969                                                 | 2.285          | 598.652              |

The following two examples will also shew, in a striking manner, the ratio of sickness experienced by two other societies circumstanced very similarly in dense City Districts.

TABLE KK.

| Age.      | Ratio of Sickness yearly to each person, expressed in<br>weeks, experienced by |                                                     |                      |
|-----------|--------------------------------------------------------------------------------|-----------------------------------------------------|----------------------|
|           | Liverpool<br>Friendly Society,<br>during 1836-40.                              | Old Provident<br>Society, Leeds,<br>during 1837-48. | Difference per cent. |
| 21 to 25  | .89                                                                            | .18                                                 | 79.78                |
| 26 ... 30 | 1.28                                                                           | .38                                                 | 70.31                |
| 31 ... 35 | 1.31                                                                           | .58                                                 | 55.72                |
| 36 ... 40 | 1.60                                                                           | .66                                                 | 58.75                |
| 41 ... 45 | 1.93                                                                           | .87                                                 | 54.92                |
| 46 ... 50 | 2.54                                                                           | 1.74                                                | 31.50                |
| 51 ... 55 | 3.96                                                                           | 2.60                                                | 34.34                |
| 56 ... 60 | 3.95                                                                           | 2.32                                                | 41.27                |
| 61 ... 65 | 6.74                                                                           | 5.84                                                | 13.35                |
| 66 ... 70 | 21.96                                                                          | 10.90                                               | 50.37                |

The difference in the preceding results is certainly very remarkable, and must satisfy every inquirer as to the danger and disastrous consequences which must follow the applica-



tion of uniform Tables to all societies. It is hoped the preceding illustrations will have the effect of preventing members of benefit clubs from falling into some of the more prevalent errors in the management of these institutions. Of late the attention of the noblemen and the more wealthy residents in the English counties seems in an especial manner to be given to the means of elevating the condition of the agricultural and working classes, by the establishment of well-constituted friendly societies, and it is hoped the present edition of this treatise will be carefully studied by them. The first thirteen editions of the pamphlet entitled "Observations on Odd Fellow and Friendly Societies" have been eagerly sought after by the working classes, and although they were sold at a price involving a considerable pecuniary sacrifice, yet should the publication of the present edition of this work, in an enlarged and permanent form, cause it to find a place in the libraries of the landed gentry, so deeply interested in the welfare of the people, the loss sustained will be amply repaid.

The evil effects resulting from Tables badly constructed for the special purposes of individual societies, can with difficulty be seen for some years after their establishment, but in the course of time inadequate contributions begin to tell, in too evident terms, the ruin and calamity which are fast hastening on the society. A large society in one of the mining districts of England, which literally subsisted for a period of sixty years, until the very last farthing of its funds was expended, without any efficient steps having been taken for its regeneration, broke down under the awful and melancholy spectacle of having upwards of 300 members, all aged 50 years and upwards, incapable of entering any other friendly society, and who had to no purpose contributed to the funds for many years. So dreadful a catastrophe is but of too frequent occurrence, and its appalling aspect is sufficient to destroy in the working man all confidence in the stability of such institutions. However, there are sufficient examples of successful management of other societies to encourage their affluent and benevolent patrons to increased efforts towards the improvement and perfection of the only institutions of the country which legitimately and distinctly call for the prudential self-efforts of the millions of the people towards their own regeneration. The following are extraordinary examples of the very different conditions of friendly societies established and uniformly conducted under the best intentions and desires for permanent prudential provisions for the members and their families. The different results ultimately arrived at in each society are most instructive.

According to the valuation made by Mr. Ansell in 1848, for the Essex Provident Society, the results arrived at:—

|                                                                                                                                                                                                             |  |             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------|
| "Present value" of the benefits promised to the members, assuming<br>that the experience of sickness in the society was no greater than<br>that indicated by the results of Mr. Ansell's treatise . . . . . |  | £208458·790 |
| "Present value" of future contributions . . . . .                                                                                                                                                           |  | £133517·573 |
| Accumulated capital . . . . .                                                                                                                                                                               |  | 33000       |

---

£166517·573

Deficiency of the funds according to Mr. Ansell's estimate . . . . .

£41941·217

---



But if the liabilities had been valued according to the actual scale of sickness to which the members are subject, the deficiency would be double the above amount. It is certainly very much to be regretted that so unfortunate a state of things should exist, that a society having been established for so long a period, should not have discovered the fallacious principles by which it is guided. Had the members adopted the plan of having periodical investigations into its affairs, and a valuation of its assets and liabilities by a competent authority, there can be no doubt that the present ruinous mode of proceeding would long ago have been checked, and a remedy applied; but now that so many of the members are advanced in life, it becomes exceedingly difficult to devise any satisfactory means likely to be adopted and carried out by the members for improving its condition.

Mr. Sotheron's recent Act will, however, for the future, render it compulsory on societies to make a return, once in every five years at least, of their assets and liabilities: and if this provision of the Act be strictly enforced, there can be no doubt that the results arrived at will occasion much useful debate and inquiry among members themselves, and finally establish sounder and more correct notions as to the management and principles of friendly societies.

Although such has been the unfortunate progress of the Essex Provident Society, there are others established in the kingdom on very similar principles, which have flourished, and are now in a really prosperous and promising condition. The following examples, if contrasted with the preceding, will shew that the scale of contributions and benefits under which one society prospers, another may decay and suffer. In the Hitchin Friendly Society, the following are the results of a valuation made in 1849, of its assets and liabilities:—

|                                                |                  |
|------------------------------------------------|------------------|
| "Present value" of gross liabilities . . . . . | £9225 17 0       |
| ... .. assets . . . . .                        | 9509 4 11        |
| Difference in favour of the society . . . . .  | <u>£283 7 11</u> |

The Hitchin Society, like the Essex Provident Society, is in a Rural District, but it is not ramified over a large space and divided into numerous branches. However, the Wilts Friendly Society, has upwards of seventy branches spread over the county, and in this respect resembles the Essex Provident Society, and may therefore be brought into comparison with it. The following are the results of an estimate of its assets and liabilities made during 1850:—

|                                               |                 |
|-----------------------------------------------|-----------------|
| "Present value" of its liabilities . . . . .  | £60610 15 5     |
| ... .. assets . . . . .                       | 61353 15 8      |
| Difference in favour of the Society . . . . . | <u>£743 0 3</u> |



Although the surplus here is but small, still it shews a very different state of things from that which belongs to the Essex Society, and it is a subject of considerable interest to understand distinctly the cause of this. It has already been seen that the rate of sickness in the latter society exceeds that for all societies collectively in England and Wales, by more than 40 per cent., while the rate of sickness in the Wilts Society has actually fallen short of that for the societies of the Rural Districts of the kingdom, and hence there is, in this fact alone, an important reason for the prosperity of the one society, and the disastrous condition of the other. These examples should be sufficient to satisfy every inquirer of the difficulties which surround such questions, and the need of judgment and experience being brought to bear on all efforts made to regenerate old societies, or to establish new ones.

Since the preceding observations were written a Return of the sickness and mortality experienced by friendly societies during the quinquennium, ending the 31st of December, 1851, has been printed by order of the House of Commons, in Parliamentary Papers, No. 955 of 1853, and No. 506 of the year 1854. The data embraced by this Return extend to 792,939 years of life, and are therefore, in magnitude, second only to the data originally brought forward in these Contributions, which included 1,217,783 years of life.

TABLE LL.

*Sickness and Mortality for Quinquennial Terms of Life according to the Government Returns relating to Friendly Societies in England and Wales.*

1846-50.

| Age.      | SICKNESS.                                           |                            |                             | MORTALITY.              |                   |                     | Age.      |
|-----------|-----------------------------------------------------|----------------------------|-----------------------------|-------------------------|-------------------|---------------------|-----------|
|           | Number exposed to the risk of Sickness at each Age. | Total Sickness (in Weeks). | Average Sickness per Annum. | Number exposed to Risk. | Number of Deaths. | Mortality per Cent. |           |
| 10        | 16                                                  | 20·571                     | 1·2857                      | 16                      | ...               | ...                 | 10        |
| 11 to 15  | 2939                                                | 2115·214                   | 0·7197                      | 2940                    | 16                | 0·5442              | 11 to 15  |
| 16 ... 20 | 25087                                               | 24476·500                  | 0·9757                      | 25098                   | 169               | 0·6734              | 16 ... 20 |
| 21 ... 25 | 88528                                               | 86781·071                  | 0·9803                      | 88556                   | 645               | 0·7284              | 21 ... 25 |
| 26 ... 30 | 123624                                              | 122736·143                 | 0·9928                      | 123684                  | 939               | 0·7592              | 26 ... 30 |
| 31 ... 35 | 126330                                              | 123377·500                 | 0·9766                      | 126402                  | 1005              | 0·7951              | 31 ... 35 |
| 36 ... 40 | 114358                                              | 127975·143                 | 1·1191                      | 114458                  | 1087              | 0·9497              | 36 ... 40 |
| 41 ... 45 | 94631                                               | 118405·786                 | 1·2512                      | 94692                   | 1050              | 1·1089              | 41 ... 45 |
| 46 ... 50 | 77550                                               | 116491·000                 | 1·5021                      | 77649                   | 1057              | 1·3613              | 46 ... 50 |
| 51 ... 55 | 54693                                               | 101470·500                 | 1·8553                      | 54778                   | 950               | 1·7343              | 51 ... 55 |
| 56 ... 60 | 39974                                               | 92677·286                  | 2·3184                      | 40061                   | 1009              | 2·5187              | 56 ... 60 |
| 61 ... 65 | 23438                                               | 78633·000                  | 3·3549                      | 23496                   | 699               | 2·9750              | 61 ... 65 |
| 66 ... 70 | 13398                                               | 67801·286                  | 5·0606                      | 13462                   | 648               | 4·9622              | 66 ... 70 |
| 71 ... 75 | 5591                                                | 47382·071                  | 8·4747                      | 5619                    | 374               | 6·6560              | 71 ... 75 |
| 76 ... 80 | 2147                                                | 25432·071                  | 11·8454                     | 2163                    | 222               | 10·2635             | 76 ... 80 |
| 81 ... 85 | 635                                                 | 9650·000                   | 15·1969                     | 644                     | 101               | 15·6832             | 81 ... 85 |
| Total .   | 792939                                              | 1145425·142                | 1·4445                      | 793718                  | 9971              | 1·2562              | Total.    |



(see Table E, pp. 20-7, and Table L, pp. 68-75). The Government Returns therefore contain about 65 per cent. of the amount of experience embodied in the First and Second Editions of this Work, but not one half the extent of data now brought under consideration. On referring to p. 424, preceding, it will be found that the Odd Fellow data are not quite so extensive as the Government Returns;—they extend to 621,561 years of life. The preceding is a condensed Abstract of the Government Returns made from the results given in p. 2 of Parliamentary Paper, No. 955 of 1853.

In Table LL there are several features of interest to which it is important to make detailed reference.

It will be observed that between ages 11-40 the rate of sickness is higher than that contained in Table E, pp. 26-7, but after that age the ratio of sickness is very much less; and to this circumstance attention is, in the first place, directed; but in order to understand better the relation between the results of the Government Returns, and those deduced from other inquiries, the following Table is submitted.

TABLE MM.

*Average ratio of Sickness, per annum, during each quinquennium, expressed in Weeks, according to:—*

| Age.      | Table E, pp. 26-7.    |               | Odd Fellows, p. 424. |               | Essex Provident, p. 436. |               | Government Returns, p. 440. |               |
|-----------|-----------------------|---------------|----------------------|---------------|--------------------------|---------------|-----------------------------|---------------|
|           | In each period = (a). | $\Sigma$ (a). | In each period = (b) | $\Sigma$ (b). | In each period = (c).    | $\Sigma$ (c). | In each period = (d).       | $\Sigma$ (d). |
| 21 to 25  | 0.8564                | 0.8564        | 0.7046               | 0.7046        | 1.291                    | 1.291         | 0.9803                      | 0.9803        |
| 26 ... 30 | 0.9014                | 1.7578        | 0.7652               | 1.4698        | 1.346                    | 2.637         | 0.9928                      | 1.9731        |
| 31 ... 35 | 0.9248                | 2.6826        | 0.8607               | 2.3305        | 1.439                    | 4.076         | 0.9766                      | 2.9497        |
| 36 ... 40 | 1.0718                | 3.7544        | 0.9783               | 3.3088        | 1.534                    | 5.610         | 1.1191                      | 4.0688        |
| 41 ... 45 | 1.3443                | 5.0987        | 1.2274               | 4.5362        | 1.712                    | 7.322         | 1.2512                      | 5.3200        |
| 46 ... 50 | 1.7185                | 6.8172        | 1.6249               | 6.1611        | 1.821                    | 9.143         | 1.5021                      | 6.8221        |
| 51 ... 55 | 2.3231                | 9.1403        | 2.1959               | 8.3570        | 3.229                    | 12.372        | 1.8553                      | 8.6774        |
| 56 ... 60 | 3.2773                | 12.4176       | 3.4839               | 11.8409       | 4.869                    | 17.241        | 2.3184                      | 10.9958       |
| 61 ... 65 | 5.4983                | 17.9159       | 5.7655               | 17.6064       | 4.126                    | 21.367        | 3.3549                      | 14.3507       |
| 66 ... 70 | 11.1279               | 29.0438       | 6.9265               | 24.5329       | 15.969                   | 37.336        | 5.0606                      | 19.4113       |

From the columns headed with the symbol of summation,  $\Sigma$ , it will be seen that the aggregate amount of sickness between ages 21-65 is nearly equal in Table E and in the Odd Fellow data; while in regard to the Government Returns it will be found that the aggregate amount of sickness is about equal between ages 21-50; but after the age of fifty, in fact, after forty-five, the Government Returns exhibit a greatly diminished ratio of sickness as compared with any of the other Tables now under consideration, and to this feature of the Government Returns it is important to direct attention.

An examination of the rate of sickness given in page 413, *ante*, will shew that, above the age of 45, in the Government Returns, it is very much lower than even that of



Mr. Ansell's Tables; indeed, their rate of sickness is lower at age 45 than any other recognised Table extant; it will be further seen that, at the higher ages, the rate of sickness is a close approximation to that set forth in the now discarded Table of the Highland Society, and between ages 65 and 70 is actually about 35 per cent. less than that of the Highland Society. It is important to understand the reason of so low a rate of sickness at the advanced ages.

The solution of this strange and remarkable feature will probably be, to a great extent, if not wholly, accounted for by the following passages in the Government Returns themselves.

"The cases of superannuation were carefully separated from the mass, and subjected each one to a rigid scrutiny to determine whether it was a case of *chronic sickness* or a case of superannuation, in the sense of retirement on a pension for *old age*. Where it was the case of a man under 60 set down technically, and technically only, as superannuated, with a *possibility of his restoration* to health and position as a contributing member, that man's case was classed under the head of sickness; the principle being to retain as many of these cases in the latter category as possible. The sickness tabulated, therefore, is the whole sickness that could be ascertained to be really such."—Parliamentary Paper, 16th August, 1853, p. vi.

And again:

"It is clearly to be understood that although separate cases of sickness, occurring to the same individual during each year, were added together so as to make the return perfectly accurate, yet that nothing but sickness in the true sense of the word, that is, sickness incapacitating from labour, and *requiring constant medical treatment, and of limited duration*, as contradistinguished from *chronic ailment*, and mere decrepitude, was considered to be sickness. For instance, *slight paralysis, blindness, mental disorder, or senile infirmity*, cannot, it was thought, fairly be classed with the sickness commonly prostrating the workman, and for relief under the visitation of which he seeks the aid of a benefit club. In the abstraction of the data on which the Tables now submitted are founded, all cases of the *above*, or any other description of *chronic malady*, which were returned under the head or term of superannuation, were carefully eliminated, where no cessation of this title to relief, and where no return to the ordinary conditions under which allowances are drawn in sickness, could be perceived."—Parliamentary Paper, 12th August, 1854, p. 7.

The preceding is certainly one of the most extraordinary circumstances connected with any inquiry hitherto made, as to the prevalence of sickness in friendly societies. It would seem as if the whole object and purpose for which such societies are instituted were lost sight of. The benefits for which all societies profess to make provisions are, allowances to members during sickness, or rather incapacity, from either physical or mental causes, to follow their usual avocations or labours. It is nowhere a feature of a friendly society to guarantee allowances during temporary sickness only. If this were so, friendly societies



and benefit clubs would not be worth supporting, and having such objects only in view, they never could have enrolled the immense number of workmen which now belong to them. The great, essential, and the noblest feature in friendly societies of every description, is the certainty that, under a skilfully developed system, they will afford to members a competent support and complete independence during periods of sickness, incapacity, and disease, however protracted. The working man, for whom such societies are more particularly designed, may struggle against the difficulties of a temporary sickness without the aid of a friendly society, but few can hope to bear up against the vicissitudes invariably attendant on long protracted or permanent illness, and it is this condition of things for which not only the earliest but the most recently formed societies make special provision: and unless this integral element is allowed to have its full weight, the great principle which should govern every society is violated. It is quite true that, in many societies, even amongst those established of late years, a reduced amount of sickness allowance is granted during long continued sickness; but in no society worthy of the name does the allowance cease altogether, or fall to even so low a sum as four or five shillings weekly. An industrious workman with possibly a large family to support on so miserable a pittance, must be reduced to pauperism itself. Friendly societies fail in their mission when, by their rules, they sanction such degradation. At all times, even when science had not taken them under her protection, they aimed at other and nobler purposes than merely to allure the poor man into them for the purpose of ultimately placing him in the workhouse in his declining years, when much of all the sickness is of a permanent, or at least of a very protracted character. Their object is now, and always has been, a higher one. There is no reason why the sickness allowance should ever be reduced under eight or ten shillings weekly: and with such a sum an honourable struggle might be made for existence; but with less, the charm of independence is broken, and friendly societies become asylums for objects of charity, instead of self-supporting and dignified institutions, elevating the moral and social condition of the people.

If, therefore, the principle of some badly constituted societies of reducing the allowances so very low during long protracted or permanent sickness is to be so strongly condemned, what can be said of the extraordinary circumstance connected with the Government Returns now under consideration, in which all such elements of sickness are left out of the results which are submitted to the country for the guidance of its friendly societies? Had a scheme been purposely contrived to pauperize the members of all the benefit and provident clubs of the kingdom, it could not be more effectually calculated to do so, than by the dissemination with Government sanction of a ratio of sickness deduced from data, in which so vital elements are excluded as "chronic ailment," "mere decrepitude," "slight paralysis," "blindness," "mental disorder," and "senile infirmity." On referring to pp. 169-200 *ante*, it will be found that those are the very afflictions which press with unusual severity after members attain 45 or 50 years of age.



It is the proper function of a friendly society to enable the many to assist the few, and all properly developed data for the regulation of their risks, should be calculated to make provision for such contingencies and diseases as above enumerated, as well as for all others. It would however seem, as if those entrusted with the preparation of the Government Returns, had an idea that the best constituted friendly societies should only provide against "sickness incapacitating from labour, *requiring constant medical treatment*, and of *limited duration*." There is not an intelligent working member of a benefit club in the whole kingdom, who would subscribe to such a principle. At the superior ages, and long before the time of life when superannuation allowances, or strictly speaking, deferred annuities are granted, there is a large amount of protracted sickness experienced, as will clearly appear from results submitted in the subsequent part of this paper, and if during that period members who are afflicted are to be deprived of all benefit from the funds of their clubs, as the treatment of the Government Returns assumes, they must then be thrown on the charity of the country. The possibility of such a thing is, however, surely incompatible with the scheme of any properly regulated and self-supporting provident institution, and such a character all friendly societies which the Government encourages ought to maintain.

The history of this practice as introduced into many friendly societies, chiefly within the last thirty or forty years, is simply as follows. Societies generally, until quite recently, commenced their career with promising members benefits for which their contributions were wholly inadequate to make ample provision; but with the limited knowledge at one time existing of the laws of sickness and mortality, everything seemed to prosper for many years, until the members who, for the most part, entered such societies young, increasing in years and infirmities, made large inroads on the funds, and then the evils of the bad adjustment of benefits and contributions became apparent. Societies, when in this insolvent condition, soon began to have recourse to every possible expedient, except the right one, to prevent themselves from sinking, and amongst other means of propping up the falling institutions, the members, seeing the great drain on their resources on account of protracted and permanent sickness, very naturally under such circumstances, reduced the amount of the allowances. The reduction was, however, rarely so great as to bring the benefits to less than two-thirds or one-half of the full pay allowance. New societies starting into existence in succeeding years, very generally copied the schemes and regulations of their predecessors, and hence the practice of reduced benefits in long continued sickness. In every instance when the reduced allowance brings the benefit to so low a scale as to be no longer adequate with prudent management to support the member in sickness, he is necessarily thrown on the parish for support, and every such society should be discouraged as wanting in the essential characteristic of a well founded institution.

If, in the analysis of the Government Returns, the elements in question had been



eliminated from the general results in order to satisfy scientific curiosity, or otherwise, and if the nature and extent of them had been furnished in another part of the published Report, no objection could have been taken to such a course, but on the contrary, useful deductions might have been drawn from that mode of treating the data: but, unfortunately, these elements have been excluded from the general results, and no record of them is given by which any one can discover the actual amount of sickness to which the various societies included in the Government Returns have been subject. The consequence is, that practically, the Returns are for all the more important purposes of friendly societies entirely worthless, in fact, from the auspices under which such defective data appear, they are calculated seriously to undo much of the good, and to destroy many of the improvements, effected in the condition of those societies during the last ten years,—the period of greatest progress in their history. The evils to be so deeply lamented in the constitution of many societies, from the adoption of the data of the Highland Society, will be but little mitigated, particularly at the higher and more important ages, by taking the data now offered by the Government for their guidance. A Committee of the House of Commons reported unfavourably, so far back as 1825, on the Highland Society's Table; and before Lord Beaumont's Committee of the Lords in 1848, and Mr. Sotheron's Committee of the Commons in 1849, conclusive evidence was adduced as to the dangerous character of the same Table. Since then, the experience of the Manchester Unity of Odd Fellows, and now the Government Returns themselves as decidedly prove the Highland Society's Table to be fallacious, and, as a consequence, demonstrate the inapplicability of the results of the Government data as now analysed for the purposes of friendly societies.

That the exclusion of the elements in question is the cause of the low ratio of sickness expressed by the Government Table, will appear evident from a consideration of the following analysis of a portion of the data appearing in this Contribution, as well as that already furnished in the five Abstracts in pp. 160-4 *ante*. On referring to Abstract D, p. 161, it will be found that the average duration of each attack of sickness not ending in death varied from four or five weeks' sickness at the younger and middle periods of life, to from 100 to 300 weeks at the more advanced ages; and, whatever may be the cause of this prolonged sickness, it equally incapacitates a member from following his occupation, and entitles him to the sickness allowances of his club. The following is a condensed Abstract of the experience of twenty-five societies over an average period of nearly twelve years each. It will be found full of curious interest and instruction, and is calculated to throw much light on the question now discussed.

It will be observed, from the results of the following Table, that from the youngest to the oldest age there is a rapidly increasing ratio of prolonged sickness. From 20 to 50 years of age the number of persons suffering from protracted sickness varies from about  $2\frac{1}{2}$  per cent. to nearly 5 per cent., but after the latter age the increased number of persons



TABLE NN.

*Ratio of Persons suffering from protracted Sickness to the total number Sick at various terms of life. The shortest duration of any one attack of what is termed protracted Sickness, being at least One Year.*

| Age.      | (a)<br>Total Number of<br>Persons actually sick. | (b)<br>Total Number of<br>Persons suffering from<br>protracted Sickness. | Ratio of (a) to (b.) |
|-----------|--------------------------------------------------|--------------------------------------------------------------------------|----------------------|
| 11 to 20  | 90                                               | 1                                                                        | 1.111                |
| 21 ... 30 | 847                                              | 21                                                                       | 2.479                |
| 31 ... 40 | 738                                              | 23                                                                       | 3.116                |
| 41 ... 50 | 548                                              | 27                                                                       | 4.927                |
| 51 ... 60 | 345                                              | 48                                                                       | 13.910               |
| 61 ... 70 | 175                                              | 80                                                                       | 45.714               |
| 71 ... 80 | 58                                               | 41                                                                       | 70.690               |
| 81 ... 90 | 17                                               | 15                                                                       | 88.235               |
| Total . . | 2818                                             | 256                                                                      | 9.084                |

liable to diseases of long duration is very considerable, and must tell seriously on the funds of a society. Between ages 61–70, upwards of 45 per cent. of all the persons sick are attacked with affections which either permanently incapacitate them, or from which recovery does not take place for upwards of one year from the date of attack. It is hence abundantly evident that every society must make some provision for this class of its members. Even at the term of life 51–60 the protracted sickness is about 14 per cent., and the neglect of a small number of such cases in the analysis of the Government Returns will fully account for results so discordant with every other series of observations. It has already been shewn in Table MM that at ages under 45 the ratio of sickness is somewhat higher in the Government Returns than according to the results of this inquiry; in fact, the aggregate sickness between ages 21–50 is, as nearly as possible, the same. In the subsequent terms of life, however, the Government Tables exhibit a very reduced ratio of sickness. The cause of this will appear evident from the facts adduced in the preceding Table. “Chronic ailments,” “mere decrepitude,” “slight paralysis,” “blindness,” “mental disorder,” and “senile infirmity,” are affections characteristic of advanced ages, and usually of a protracted nature, and their exclusion must produce results such as those appearing in the Government Returns.

Some of the societies in Scotland, whose experience is recorded in Table L, pp. 68–75 *ante*, make a distinction between acute sickness and that which permits of “walking about” out of doors. This latter sickness, in many instances, resembles the “protracted sickness” of the preceding Table, and the ratio of it to the total sickness will accordingly be found to increase with increase of age. The following is the result of an analysis of the sickness experienced by the societies which make the distinction now explained.



TABLE OO.

*Ratio of "Walking about" Sickness to Total Sickness at various terms of life—expressed in weeks.*

| Age.      | Population. | Total Sickness. | Walking about Sickness. | Ratio of Walking about Sickness to Total Sickness. |
|-----------|-------------|-----------------|-------------------------|----------------------------------------------------|
| 10 to 15  | 133         | 29·000          | 13·286                  | 45·813                                             |
| 16 ... 20 | 1049        | 958·428         | 574·714                 | 59·964                                             |
| 21 ... 25 | 4139        | 3807·714        | 2083·571                | 54·720                                             |
| 26 ... 30 | 6845        | 5830·285        | 2951·285                | 50·620                                             |
| 31 ... 35 | 7182        | 5681·429        | 2680·427                | 47·179                                             |
| 36 ... 40 | 6697        | 5929·999        | 3307·713                | 55·779                                             |
| 41 ... 45 | 5613        | 6345·142        | 4176·000                | 65·814                                             |
| 46 ... 50 | 5015        | 7495·571        | 4643·856                | 61·955                                             |
| 51 ... 55 | 4234        | 9812·714        | 6735·570                | 68·641                                             |
| 56 ... 60 | 3204        | 9615·572        | 7073·571                | 73·564                                             |
| 61 ... 65 | 2163        | 10558·572       | 8899·236                | 84·285                                             |
| 66 ... 70 | 1164        | 12203·142       | 9868·285                | 80·867                                             |
| 71 ... 75 | 616         | 10147·714       | 8400·143                | 82·779                                             |
| 76 ... 80 | 330         | 7315·714        | 6472·286                | 88·471                                             |
| 81 ... 85 | 129         | 2968·857        | 2616·143                | 88·120                                             |
| 86 ... 90 | 30          | 876·000         | 772·000                 | 88·128                                             |
| 91 ... 95 | 3           | 2·000           | ...                     | ...                                                |
| Total     | 48546       | 99577·853       | 71268·136               | 71·570                                             |

From this Table it will be seen that at advanced ages, when the more chronic forms of disease prevail, as shewn in pp. 169–99 *ante*, the ratio of "walking about" sickness is much increased. Between ages 21–50, the ratio is from 50 to 60 per cent., but above the age of 50, the ratio varies from 68 to 88 per cent., and on the average of all ages, the ratio of "walking about" sickness is 71·570 per cent. Consequently, when sick pay is regulated by this distinction, it must materially affect the liabilities of the societies, and in all such cases the data furnished in the preceding Table will be found valuable in the adjustment of the contributions and benefits. In like manner will the data of protracted sickness, given in Table NN, be found useful in the determination of the rates for societies in which the benefits are affected by the duration of the sickness.

It may not be without interest to direct attention, at this place, to the sickness experienced by one of the largest societies connected with the great railway interests of this country. The following Table shews the amount of sickness experienced by the Great Western Railway Friendly Society during the five years ending December 1851.

In the following Table it will be found that the total amount of sickness was 7189·429 weeks, while, according to the ratio of England and Wales generally, as given in Table V, p. 409, the amount of sickness would have been 6145·048 weeks only; but the feature to which attention is more particularly directed in the following Table is the relation of "full-pay" sickness to the total sickness. From this Table it appears that



## INFLUENCE OF LOCALITY ON SICKNESS.

TABLE PP.

*Sickness experienced by the Great Western Railway Friendly Society—expressed in weeks.*

| Age.      | Number of Years' Risk. | Total Sickness. | Full-Pay Sickness only. | Ratio per Cent. of Full-Pay Sickness to Total Sickness. | Sickness per annum to each Member. |
|-----------|------------------------|-----------------|-------------------------|---------------------------------------------------------|------------------------------------|
| 21 to 25  | 1032.5                 | 1061.286        | 1061.286                | 100.000                                                 | 1.028                              |
| 26 ... 30 | 2219.0                 | 2274.857        | 2123.857                | 93.350                                                  | 1.025                              |
| 31 ... 35 | 2049.0                 | 2279.572        | 1921.429                | 84.660                                                  | 1.112                              |
| 36 ... 40 | 817.5                  | 974.142         | 811.999                 | 83.355                                                  | 1.192                              |
| 41 ... 45 | 241.5                  | 301.285         | 301.285                 | 100.000                                                 | 1.248                              |
| 46 ... 50 | 56.0                   | 112.001         | 112.001                 | 100.000                                                 | 2.000                              |
| 51 ... 66 | 17.5                   | 186.286         | 33.857                  | 18.175                                                  | 10.645                             |
| Total . . | 6433.0                 | 7189.429        | 6365.714                | 88.545                                                  | 1.115                              |

the great bulk of the members of the society being under the age of 40, the "full-pay" sickness amounted, on the average, to no more than 88.545 per cent. of the whole sickness, the remainder or 11.455 per cent. being of the protracted character, which during the term of life 51-66 was 81.825 per cent. of all the sickness of that period.

Another interesting illustration of the character of the diseases producing temporary and permanent sickness, as well as "bed-lying" and "walking-about" sickness, is derived from the experience of the "Thistle and Rose" during the years 1841-8.

TABLE QQ.

*Duration of Temporary and Permanent Sickness, distinguishing Bed-lying from Walking-about Sickness, from attacks of various classes of Disease—expressed in Weeks.*

| Class of Disease.                                                              | Number of Persons Sick. | Amount of Sickness expressed in Weeks. |          |            |          |                                       |                                            |
|--------------------------------------------------------------------------------|-------------------------|----------------------------------------|----------|------------|----------|---------------------------------------|--------------------------------------------|
|                                                                                |                         | Temporary.                             |          | Permanent. |          | Total amount of Sickness experienced. | Average amount of Sickness to each Person. |
|                                                                                |                         | Bed-lying.                             | Walking. | Bed-lying. | Walking. |                                       |                                            |
| I. Zymotic Diseases . . . . .                                                  | 90                      | 242.429                                | 138.858  | ...        | ...      | 381.287                               | 4.236                                      |
| II. Dropsy, Cancer, and other Diseases of uncertain or variable seat . . . . } | 10                      | 68.859                                 | 6.000    | ...        | ...      | 74.857                                | 7.486                                      |
| III. Tubercular Diseases . . . . .                                             | 16                      | 28.429                                 | 80.571   | ...        | 7.571    | 116.571                               | 7.286                                      |
| IV. Diseases of the Brain, Spinal Marrow, Nerves, and other Senses . . . }     | 47                      | 240.571                                | 169.571  | 103.857    | 945.286  | 1459.284                              | 31.048                                     |
| V. Diseases of the Heart and Blood Vessels . . . . .                           | 5                       | 61.714                                 | 22.714   | 6.857      | 28.286   | 119.571                               | 23.914                                     |
| VI. Diseases of the Lungs, and of the other Organs of Respiration . . . . }    | 72                      | 297.287                                | 126.572  | 230.571    | 114.143  | 768.573                               | 10.925                                     |
| VII. Diseases of the Stomach, Liver and other Organs of Digestion . . . }      | 43                      | 103.571                                | 130.000  | ...        | ...      | 233.571                               | 5.432                                      |
| VIII. Diseases of the Kidneys, &c. . . . .                                     | 3                       | 23.571                                 | 11.714   | ...        | ...      | 35.285                                | 11.762                                     |
| X. Rheumatism, Diseases of the Bones, Joints, &c. . . . .                      | 42                      | 132.714                                | 224.858  | 16.429     | 330.857  | 705.858                               | 16.806                                     |
| XI. Diseases of the Skin, Cellular Tissue, &c. . . . .                         | 10                      | 46.429                                 | 22.143   | 29.857     | ...      | 98.529                                | 9.843                                      |
| XIII. Debility . . . . .                                                       | 10                      | 13.429                                 | 30.000   | ...        | 14.286   | 57.715                                | 5.772                                      |
| XVII. Violence, External Causes, Injuries, &c. . . . .                         | 37                      | 105.714                                | 106.857  | ...        | 2.000    | 214.571                               | 5.799                                      |
| All Causes . . . . .                                                           | 385                     | 1365.715                               | 1069.858 | 387.571    | 1442.429 | 4265.572                              | 11.079                                     |



The data, it will be observed, are not sufficiently numerous in the preceding Table to justify the insertion of the sub-divisions of each class of disease, but the results, as above given, are, notwithstanding, highly instructive on the question of protracted sickness. The classification of the diseases is the same as that followed in pp. 172-9, *ante*. The highest ratio of permanent and protracted sickness will be found in Class IV, Diseases of the Brain and Nervous System, and, as already pointed out in various parts of this Contribution, as well as in p. 183, *ante*, this class of disease is characteristic of the more advanced ages. Classes VI and X stand next in order with respect to permanent sickness, the principal invaliding being from Asthma in the former, and from Rheumatism in the latter. The last column of the preceding Table shews the average duration of temporary and permanent sickness in the aggregate, and it will be found that the various classes of disease stand in the following order in regard to the duration of the attacks of sickness, namely, IV, V, X, VIII, VI, XI, II, III, XVII, XIII, VII, and I, the zymotic class of disease shewing, as might be expected, the shortest duration of attack. The highest duration is 31.048 weeks, being in Class IV, Diseases of the Brain and Nervous System, the shortest, as just stated, in Class I, Zymotic Diseases, being 4.236 weeks, and the average of all is 11.079 weeks.

These facts it is believed are quite sufficient to point out the importance of protracted and permanent sickness being provided for in the pecuniary scheme of every properly constituted friendly society, and the danger attendant on the use of data from which elements so important have been excluded.

The following are the results of a combination of the elementary data of some interest, in a form not hitherto attempted, and from which some useful conclusions may be drawn. In the preceding Tables the rate of mortality has invariably been regarded in relation to every member of the society or societies, at the given ages; but in column 2 of the following Table will be found the results of a different combination. All the members, at every year of life, or rather all the members of exactly the same age, being placed in one group, the number of these that had actually experienced sickness during the course of that year of life was recorded. And these being abstracted from the total number of members of the same age, column 2 was deduced, expressing for quinquennial periods of life the per-centage of members that are actually sick in the course of one year; for example, out of every hundred members aged 31-35 in a society, twenty-one will be on the sick list during some part of the year; but of the same number of members aged 61-65, at least thirty-five members will be sick during some period or other of the year.

An inspection of column 2 will shew that, from the younger ages up to the period 31-35, the ratio or chance for any given member to be sick diminishes; but that from that period of life upwards, the tendency for any given member to be sick increases in a uniform and regular series. No Table of this kind has hitherto existed; and it is



believed, that in addition to the more general purposes of Vital Statistics, it will be practically useful to benefit societies, in enabling them to determine whether the numbers on their sick list be greater or less than the average. Table V will afford a means to determine whether the total amount of sickness in a society be greater than the average; but the present Table simply points out the proportion of members to be expected on the sick list, and is perhaps more important than the other, as a test of the means of selection adopted for the admission of members.

Column 3 is simply a modification of column 2, and needs no explanation further than to state, that it will afford a ready means of testing the relation of the sick to the non-sick members in any one year, when placed in separate groups, as is generally done in benefit societies.

TABLE RR.

| Age.       | Per-Centage of Members Sick during each Year. | Ratio of Sick Members to every 100 not Sick in every Year. | Mortality per Cent. among those Actually Sick. | Sickness per Annum among those Actually Sick. | Total Amount of Sickness to each Death. | Age.       |
|------------|-----------------------------------------------|------------------------------------------------------------|------------------------------------------------|-----------------------------------------------|-----------------------------------------|------------|
| 11 to 15   | 21.9565                                       | 28.1337                                                    | .9901                                          | 4.1231                                        | 416.4290                                | 11 to 15   |
| 16 ... 20  | 22.0743                                       | 28.3273                                                    | 2.8571                                         | 3.5887                                        | 125.6032                                | 16 ... 20  |
| 21 ... 25  | 22.0386                                       | 28.2686                                                    | 3.0539                                         | 3.8518                                        | 126.1271                                | 21 ... 25  |
| 26 ... 30  | 21.6997                                       | 27.7134                                                    | 3.3271                                         | 4.1921                                        | 125.9977                                | 26 ... 30  |
| 31 ... 35  | 21.0147                                       | 26.6058                                                    | 3.7592                                         | 4.3585                                        | 115.9411                                | 31 ... 35  |
| 36 ... 40  | 21.5471                                       | 27.4650                                                    | 4.0686                                         | 4.9463                                        | 121.5732                                | 36 ... 40  |
| 41 ... 45  | 22.9858                                       | 29.8463                                                    | 4.5306                                         | 5.9418                                        | 131.1468                                | 41 ... 45  |
| 46 ... 50  | 24.6042                                       | 32.6333                                                    | 5.1657                                         | 6.8556                                        | 132.7123                                | 46 ... 50  |
| 51 ... 55  | 27.6422                                       | 38.2022                                                    | 6.2401                                         | 8.5104                                        | 136.3839                                | 51 ... 55  |
| 56 ... 60  | 30.2424                                       | 43.3535                                                    | 7.2732                                         | 10.9261                                       | 150.2235                                | 56 ... 60  |
| 61 ... 65  | 35.5676                                       | 55.2015                                                    | 8.6163                                         | 15.1975                                       | 176.3808                                | 61 ... 65  |
| 66 ... 70  | 46.8493                                       | 88.1443                                                    | 9.6004                                         | 24.2217                                       | 252.2988                                | 66 ... 70  |
| 71 ... 75  | 58.3750                                       | 140.2400                                                   | 12.1306                                        | 32.6275                                       | 268.9679                                | 71 ... 75  |
| 76 ... 80  | 73.5916                                       | 278.6667                                                   | 11.3636                                        | 36.2367                                       | 318.8876                                | 76 ... 80  |
| 81 ... 85  | 74.4624                                       | 291.5790                                                   | 18.4116                                        | 37.7633                                       | 205.1064                                | 81 ... 85  |
| 86 ... 90  | 79.4872                                       | 387.5000                                                   | 17.2043                                        | 41.0829                                       | 238.7943                                | 86 ... 90  |
| 91 ... 95  | 50.0000                                       | 100.0000                                                   | ...                                            | 39.2450                                       | ...                                     | 91 ... 95  |
| 96 ... 100 | ...                                           | ...                                                        | ...                                            | ...                                           | ...                                     | 96 ... 100 |

In Tables E, F, and G, &c., the rate of mortality was given for the general population of friendly societies; but in the fourth column of the preceding Table will be found the mortality per cent. among those persons actually sick. The mortality among the population generally has been shewn to increase with age; so also does the mortality among those persons actually sick increase with age.

In the quinquennial period of life, 21-25, the mortality among those sick is 3.0539 per cent.; but in the advanced period of life, 66-70, the mortality is increased to 9.6004 per cent., or more than three times that of the other period. An inspection of this column will shew that there is a uniform and gradual increase of the rate of mortality.



Tables of this kind are calculated to throw important light on the subject of Vital Statistics. A chronological series would point out any change or modification that may have taken place in the intensity and severity of disease. By the aid of the information given in column 4, premiums may easily be determined for the assurance of lives while actually sick; but as the results in that column do not distinguish sickness under particular diseases, a knowledge of the disease under which the patient might be suffering would be of no assistance to parties undertaking the risk: but if particular diseases, with the sickness and mortality under each, were given in separate classes, then the results would apply to given diseases, in the same manner in which the above results will apply to sickness in general, irrespective of disease. An application of columns 2 and 4 will afford the means of measuring the exact liabilities of a friendly society; and if the same means were available to an assurance company of ascertaining the ratio of its members sick, the principles of determining the liabilities in those companies would undergo an important change.

Suppose that any particular society contains 3647 members, equally distributed over the ten quinquennial terms of life, from 20 to 70 years of age, one thousand of them would be found on the sick list in the course of a year, and of one thousand persons found sick, fifty-six deaths would take place in that year; but if in the actual result the balance of those numbers was in any way disturbed, that circumstance would tend to shew whether the selection of lives in the society was of a favourable or unfavourable character.

The results in column 4 were obtained by direct observation; but it is evident that if  $m$  is made to represent the rate of mortality per cent. as given in Tables E and F, and  $a$  the results in column 2, then

$$\frac{m \times 100}{a} = \text{column 4.}$$

It is obvious that in applying the results in this Table to any practical purpose, independent calculations must be made for each term of years, otherwise errors of the same nature as those pointed out at page 45 would affect the result.

Column 5 of the same Table will be found to represent the amount of sickness per annum among those actually sick. From the age of 15 upwards, the amount of sickness will be found to increase in a regular and uninterrupted series. At the term of life, 21-25, there is 3.8518 weeks' sickness in a year to each person, but at the term 66-70 there is 24.2217 weeks' sickness to each person actually sick.

Without any further inquiry on this point, the manner in which it will bear on what is called permanent sickness in friendly societies is obvious. It will thus be seen, that not only have advanced years a greater liability to sickness, but that, once on the sick list, its duration receives a most remarkable increase. It will also be further seen, that at the



two terms of life, 21–25 and 66–70, the relative chances of being sick are in the ratio of 220 to 468, while the mortality at the same terms of life is in the ratio of 31 to 96 among those actually sick; and that the amount of sickness to those persons at the respective ages, shews the remarkable disparity of 39 to 242.

The cares, anxiety, and suffering with which the decline of life is thus beset, appear to form a most striking contrast to the improvident carelessness with which, in youth, any provision for those calamities is regarded. “If any man will not work, neither shall he eat;” and as “the time cometh when no man can work,” it is in the summer of life that abundant provision must be made for the vicissitudes of that winter which incapacitates for labour; but how mortifying must be the disappointment which falls on the hopes of those patient contributors to friendly societies, who, after thirty or forty years’ experience, find, in the decline of life, when thrown by their infirmities on those societies for support, no brighter prospect than the severe and harassing privations of pauperism, or the consolations of a workhouse.

The results of column 5 may be obtained in the same manner as that just described for column 4, viz.:—Let  $s$  represent the average sickness per annum, as given in Tables E and V, and  $a$  the results in column 2; then

$$\frac{s \times 100}{a} = \text{column 5.}$$

It must be kept in view, that the results in this column, as well as those given in the whole of the Table, will be much influenced by local circumstances and peculiarity of employment, and that it is not to be thought that they can be applied with safety to all societies promiscuously. Considerable experience and discrimination will always be required, to determine the due application of many of the most important practical results here presented.

Perhaps the most curious and interesting part of the preceding Table is column 6, as it presents some remarkable and novel features connected with Vital Statistics. A careful survey of the figures presented will shew, that although, as age advances, the human constitution has a greater tendency to decay, and greater liability to sickness, still it presents the apparent anomaly of having, in advanced life, a greater power of enduring sickness than in younger life; and that, although there is less power to resist the approach of disease, there is a higher capability of sustaining its insidious and destroying agency.

At the period of life 31–35, it will be seen that for every 116 weeks of sickness there is one death; but at the term of life 66–70, there is only one death for 252 weeks of sickness; or in other words, a greater amount of sickness is required to destroy life at advanced ages than at younger ages.



This peculiar feature, which seems to have been unexpected by those giving attention to such subjects, may be explained in several ways. Many of the diseases prevalent in younger life disappear in after years; and, in passing from the diseases peculiar to youth, other diseases ensue, which, although not so acute in their nature, are yet fatal in their results; and thus the change from the acute to the more chronic form of disease will impart increased duration, but not severity, to the sick-list of a society. Again, many fatal diseases of youth, such as Consumption and other Diseases of the Chest, do not, to any great extent, incapacitate from labour; and in those diseases the mortality may be high, while the amount of sickness is small.

Nothing like a proper enumeration of all the practical applications of the preceding Table is here contemplated; but it may not be out of place to refer to a few of the more obvious uses to which it may be applied. In friendly societies, a correct record of the amount of sickness among the members will afford the means of predicting the number of deaths to be looked forward to, as well as the class of members among which such deaths are most to be expected. Investigations into the affairs of a society will also be much aided by a skilful survey of the relative amount of sickness to the deaths among the members. Provided that, over a sufficiently long period, an unusually large amount of sickness was found to prevail in relation to the number of deaths, it might be safely inferred that some peculiar element affected the results; but if both sickness and mortality should shew a marked augmentation beyond the calculated numbers, then such a feature might be regarded as evidence of an inferior condition of health among the members of that society. For the more important purposes of medical science, the results in column 6 are easily available. Perhaps no simpler numerical test could be offered of the efficiency of particular modes of treatment; but to apply the results here given with much success, the figures should have been classified according to the sickness and mortality of particular diseases. A portion of the elementary data will admit of such a classification; and it is intended to publish the results on some future occasion.

Suppose a medical practitioner to have within the circle of his patients one thousand persons, whose ages vary from 21 to 70 years, and equally spread over that term of life; according to the results here given, he ought to expect 274 of them to be on his sick list during the course of a year—that they would experience 2430 weeks' sickness in the aggregate—and that there would be about sixteen deaths out of that number in the same time; and presuming that he were to visit each patient every alternate day, it would produce 8505 visits in the course of a year, or about 23 visits daily. Societies and many other public bodies adopt a practice of paying an annual sum for medical attendance and advice; and it will thus be seen that means are available by which to calculate the probable amount of labour and time that may be required for the discharge of such engagements.

A few years since, in order to satisfy some speculations on the subject of Scrofula,



then under investigation by Mr. Phillips in the preparation of his distinguished Treatise on the Nature, Causes, and Prevalence of that disease, and also with the view of elucidating some points of an interesting inquiry, which was conducted about the same time by Dr. Guy of King's College, a combination was made of the data on which this contribution is founded, so as to exhibit the sickness and mortality of factory occupations, of in-door occupations requiring great exercise, and of the same occupations requiring little exercise, and also of out-door occupations requiring great exercise, and of the same occupations requiring little exercise. The classification of in-door and out-door occupations was intended to exhibit the difference, if any, due to fresh and pure air in contrast with that of impure air inhaled in confined places, and the further analysis of distinguishing between great and little exercise was intended to satisfy the requirements of certain conditions appearing in the results arrived at in pp. 1-66 *ante*. The following Table contains the results for factory occupations.

TABLE S S.

*Mortality and Sickness amongst Factory Occupations.—Rural Districts, Towns, and Cities.—Sickness expressed in Weeks.*

| Age.      | Population. | Deaths. | Mortality per Cent. | Total Sickness. | Sickness per Annum = (a.) | $\Sigma$ (a.) | Sickness per Annum Table E, data for England, = (b.) | $\Sigma$ (b.) |
|-----------|-------------|---------|---------------------|-----------------|---------------------------|---------------|------------------------------------------------------|---------------|
| 10 to 15  | 285         | ...     | ...                 | 385.425         | 1.352                     |               | .7530                                                |               |
| 16 ... 20 | 1443        | 29      | 2.010               | 2334.140        | 1.618                     |               | .8288                                                |               |
| 21 ... 25 | 3279        | 29      | .884                | 2187.856        | .667                      | } 1.416       | .8564                                                | } 1.7578      |
| 26 ... 30 | 4989        | 30      | .601                | 3736.139        | .749                      |               | .9014                                                |               |
| 31 ... 35 | 5820        | 61      | 1.048               | 7020.138        | 1.206                     | } 3.035       | .9248                                                | } 3.7544      |
| 36 ... 40 | 5759        | 47      | .816                | 8138.705        | 1.413                     |               | 1.0718                                               |               |
| 41 ... 45 | 5509        | 32      | .581                | 6368.852        | 1.156                     | } 5.752       | 1.3443                                               | } 6.8172      |
| 46 ... 50 | 5131        | 58      | 1.130               | 8009.137        | 1.561                     |               | 1.7185                                               |               |
| 51 ... 55 | 4080        | 72      | 1.765               | 10023.137       | 2.457                     | } 12.111      | 2.3231                                               | } 12.4176     |
| 56 ... 60 | 3189        | 97      | 3.042               | 12444.140       | 3.902                     |               | 3.2773                                               |               |
| 61 ... 65 | 2078        | 62      | 2.984               | 11945.426       | 5.749                     | } 26.877      | 5.4983                                               | } 29.0438     |
| 66 ... 70 | 1384        | 62      | 4.480               | 12480.140       | 9.017                     |               | 11.1279                                              |               |
| 71 ... 75 | 691         | 81      | 11.722              | 11668.708       | 16.887                    | } 79.620      | 18.4056                                              | } 73.5060     |
| 76 ... 80 | 304         | 24      | 7.895               | 10900.140       | 35.856                    |               | 26.0566                                              |               |
| 81 ... 85 | 130         | 6       | 4.615               | 5299.427        | 40.765                    |               | 28.2665                                              |               |
| 86 ... 90 | 71          | 5       | 7.042               | 2953.715        | 41.602                    |               |                                                      |               |
| 91 ... 95 | 19          | ...     | ...                 | 208.000         | 10.947                    |               |                                                      |               |
| Total. .  | 44161       | 695     | 1.574               | 116103.225      | 2.629                     |               |                                                      |               |



Taking the whole range of the two classes of data compared in the preceding Table, no very decided or striking differences will be found. Under the age of 20, the sickness amongst the factory trades is high; in the next decennium, very low; and thence onward, sometimes higher and sometimes lower than for the whole of England and Wales. If the summation columns,  $\Sigma$ , be compared, it will be seen that the aggregate sickness in factory occupations, between ages 21–60, is nearly the same as that for England and Wales generally, and over the more extended period of life, 21–70, the sickness is less than in the country generally. After the age of 70, the numbers are too small to warrant comparison. This Table will be very useful as affording a test of the condition of health amongst those actively employed in this great branch of national industry. Those curious about the views which medical inquirers take of the results indicated in column 4, will be interested by a perusal of chapter IX in Mr. Phillips's Treatise on Scrofula.

In the next place, attention is directed to the results of the combinations shewn in the following Tables, T T and V V, the former shewing the mortality and sickness of in-door occupations requiring little exercise, and the latter requiring great exercise.

TABLE T T.

*Sickness and Mortality amongst In-door Occupations requiring little exercise.—The Sickness expressed in Weeks.*

| Age.       | Population. | Deaths. | Mortality per Cent. | Total Sickness. | Sickness per Annum. |
|------------|-------------|---------|---------------------|-----------------|---------------------|
| 10 to 15   | 77          | ...     | ...                 | 36·999          | ·481                |
| 16 ... 20  | 708         | 5       | ·706                | 851·285         | 1·202               |
| 21 ... 25  | 3418        | 29      | ·849                | 2702·857        | ·791                |
| 26 ... 30  | 6062        | 53      | ·874                | 4991·713        | ·823                |
| 31 ... 35  | 6894        | 59      | ·856                | 6056·571        | ·879                |
| 36 ... 40  | 6503        | 59      | ·907                | 7032·428        | 1·081               |
| 41 ... 45  | 5132        | 52      | 1·013               | 5738·857        | 1·118               |
| 46 ... 50  | 4224        | 47      | 1·113               | 4461·713        | 1·056               |
| 51 ... 55  | 3003        | 60      | 1·998               | 6429·427        | 2·141               |
| 56 ... 60  | 2361        | 56      | 2·372               | 7589·000        | 3·214               |
| 61 ... 65  | 1399        | 51      | 3·646               | 7297·141        | 5·216               |
| 66 ... 70  | 882         | 44      | 4·989               | 9532·000        | 10·807              |
| 71 ... 75  | 486         | 39      | 8·025               | 8805·714        | 18·119              |
| 76 ... 80  | 202         | 20      | 9·901               | 6025·284        | 29·828              |
| 81 ... 85  | 64          | 16      | 25·000              | 1889·857        | 29·529              |
| 86 ... 90  | 26          | 4       | 15·384              | 746·286         | 28·703              |
| 91 ... 95  | 5           | 1       | 20·000              | 14·000          | 2·800               |
| 96 ... 100 | 1           | ...     | ...                 | ...             | ...                 |
| Total . .  | 41447       | 595     | 1·436               | 80201·132       | 1·935               |



TABLE V V.

*Sickness and Mortality amongst In-door Occupations requiring great exercise.—The Sickness expressed in Weeks.*

| Age.      | Population. | Deaths. | Mortality per Cent. | Total Sickness. | Sickness per Annum. |
|-----------|-------------|---------|---------------------|-----------------|---------------------|
| 10 to 15  | 21          | ...     | ...                 | 33.000          | 1.571               |
| 16 ... 20 | 408         | 1       | .245                | 251.855         | .617                |
| 21 ... 25 | 1954        | 11      | .563                | 1132.714        | .580                |
| 26 ... 30 | 3599        | 33      | .917                | 2941.571        | .817                |
| 31 ... 35 | 4315        | 41      | .950                | 3240.428        | .751                |
| 36 ... 40 | 3833        | 48      | 1.252               | 3878.426        | 1.012               |
| 41 ... 45 | 3141        | 35      | 1.114               | 3806.715        | 1.212               |
| 46 ... 50 | 2602        | 45      | 1.729               | 4693.857        | 1.804               |
| 51 ... 55 | 1751        | 35      | 1.999               | 2893.713        | 1.653               |
| 56 ... 60 | 1293        | 32      | 2.475               | 4137.857        | 3.200               |
| 61 ... 65 | 728         | 24      | 3.297               | 3936.857        | 5.408               |
| 66 ... 70 | 392         | 23      | 5.867               | 4253.143        | 10.850              |
| 71 ... 75 | 208         | 14      | 6.731               | 4609.715        | 22.162              |
| 76 ... 80 | 65          | 6       | 9.231               | 1421.571        | 21.870              |
| 81 ... 85 | 39          | 2       | 5.128               | 1276.571        | 32.733              |
| 86 ... 90 | 9           | 2       | 22.222              | 218.000         | 24.222              |
| Total . . | 24358       | 352     | 1.445               | 42725.993       | 1.754               |

The necessity of economising space, to prevent this volume growing to inordinate dimensions, will prevent Tables of Decrements from being given of the mortality in the two preceding and the two following Tables; but the next Abstract of the expectation of life for a few ages will serve to give a very correct idea of the relative degrees of mortality in the four classes of occupations now under consideration.

| Age. | Expectation of Life in   |                 |                           |                 |
|------|--------------------------|-----------------|---------------------------|-----------------|
|      | In-door Occupations with |                 | Out-door Occupations with |                 |
|      | Little Exercise.         | Great Exercise. | Little Exercise.          | Great Exercise. |
| 20   | 41.8822                  | 42.0133         | 37.8017                   | 43.4166         |
| 30   | 35.1170                  | 34.5022         | 30.1435                   | 36.5832         |
| 40   | 27.9113                  | 27.8004         | 23.0357                   | 29.1284         |
| 50   | 20.5022                  | 21.1805         | 17.2754                   | 21.9732         |
| 60   | 14.0430                  | 15.1413         | 11.0169                   | 15.5635         |
| 70   | 8.6490                   | 10.4407         | 4.5607                    | 9.3313          |



This Abstract is full of interest as to the effect of occupations on health. It will be observed that in regard to In-door occupations, the expectation of life differs little until after age 40, and then there is a decided difference in favour of the occupations requiring great exercise: but in respect to the Out-door occupations, the section requiring little exercise exhibits a most remarkable inferiority in the value of life. The results are certainly very striking, and are calculated to throw much light on many obscure and vexed questions connected with inquiries made into the sanitary condition of our large towns. These results are strongly corroborative of some of the observations made in the early part of this volume, and viewed in conjunction with the data contained in pp. 17-101 support the opinion that differences in occupations of the people have a greater influence on the mortality than any peculiarity due to differences in locality, the drainage of towns, or the ventilation of dwellings. The expectation of life in the section of Out-door occupations requiring little exercise is not only remarkably below that of the Out-door occupations with great exercise, but is actually less than either of the In-door sections, and is even 20 per cent. less than the In-door section with little labour. An extension of this branch of the inquiry would probably shew that concomitant with Out-door labour requiring little exercise, there may be peculiarities of personal habits not essential to the occupation itself; (as shewn in the preceding Contribution on intemperate lives,) which may to some extent account for the high rate of mortality.

The following Tables shew the rate of mortality and sickness at each term of life, for the two sections of Out-door occupations.

TABLE W W.

*Sickness and Mortality amongst Out-door Occupations requiring little exercise.—The Sickness expressed in Weeks.*

| Age.      | Population. | Deaths. | Mortality per Cent. | Total Sickness. | Sickness per Annum. |
|-----------|-------------|---------|---------------------|-----------------|---------------------|
| 10 to 15  | 4           | ...     | ...                 | 22·000          | 5·500               |
| 16 ... 20 | 103         | ...     | ...                 | 54·571          | ·530                |
| 21 ... 25 | 520         | 3       | ·577                | 589·713         | 1·134               |
| 26 ... 30 | 1096        | 9       | ·821                | 861·000         | ·786                |
| 31 ... 35 | 1486        | 14      | ·942                | 1281·141        | ·862                |
| 36 ... 40 | 1237        | 16      | 1·294               | 1179·428        | ·954                |
| 41 ... 45 | 984         | 21      | 2·134               | 1661·142        | 1·688               |
| 46 ... 50 | 703         | 16      | 2·276               | 996·856         | 1·418               |
| 51 ... 55 | 455         | 14      | 3·077               | 877·571         | 1·929               |
| 56 ... 60 | 331         | 6       | 1·813               | 1010·001        | 3·051               |
| 61 ... 65 | 170         | 7       | 4·118               | 660·285         | 3·884               |
| 66 ... 70 | 98          | 5       | 5·102               | 1364·857        | 13·927              |
| 71 ... 75 | 30          | 7       | 23·333              | 388·143         | 12·938              |
| 76 ... 80 | 26          | 7       | 26·923              | 492·143         | 18·929              |
| 81 ... 85 | 3           | ...     | ...                 | 78·000          | 26·000              |
| 86 ... 90 | 4           | 1       | 25·000              | 148·000         | 37·000              |
| Total     | 7250        | 126     | 1·738               | 11664·851       | 1·609               |



## INFLUENCE OF LOCALITY ON SICKNESS.

TABLE Y Y.

*Sickness and Mortality amongst Out-door Occupations requiring great exercise.—The Sickness expressed in Weeks.*

| Age.      | Population. | Deaths. | Mortality per Cent. | Total Sickness. | Sickness per annum. |
|-----------|-------------|---------|---------------------|-----------------|---------------------|
| 10 to 15  | 28          | ...     | ...                 | 13·000          | ·464                |
| 16 ... 20 | 576         | 4       | ·694                | 497·856         | ·864                |
| 21 ... 25 | 2648        | 20      | ·755                | 2124·856        | ·802                |
| 26 ... 30 | 4592        | 41      | ·893                | 4212·429        | ·917                |
| 31 ... 35 | 5475        | 34      | ·621                | 4411·857        | ·806                |
| 36 ... 40 | 5425        | 50      | ·922                | 5784·999        | 1·066               |
| 41 ... 45 | 4407        | 36      | ·817                | 4665·571        | 1·059               |
| 46 ... 50 | 3510        | 54      | 1·538               | 4065·857        | 1·158               |
| 51 ... 55 | 2613        | 48      | 1·837               | 5083·999        | 1·946               |
| 56 ... 60 | 1881        | 39      | 2·073               | 4880·000        | 2·594               |
| 61 ... 65 | 1215        | 31      | 2·551               | 4882·714        | 4·019               |
| 66 ... 70 | 791         | 30      | 3·793               | 8396·714        | 10·615              |
| 71 ... 75 | 346         | 23      | 6·647               | 6387·428        | 18·461              |
| 76 ... 80 | 179         | 18      | 15·126              | 5075·284        | 42·649              |
| 81 ... 85 | 64          | 7       | 10·938              | 1775·143        | 27·737              |
| 86 ... 90 | 32          | 4       | 12·500              | 1040·143        | 32·505              |
| 91 ... 95 | 4           | ...     | ...                 | 208·715         | 52·179              |
| Total . . | 33786       | 439     | 1·299               | 63506·565       | 1·880               |

In order to obtain a better view of the general results as to sickness, in not only the two preceding Tables, but also in Tables T T and V V, the following Abstract has been prepared.

*Sum of the rate of Sickness per annum at each quinquennial term of life—expressed in Weeks.*

| Age.      | In-door Occupations with |                 | Out-door Occupations with |                 | England and Wales, Three Districts. |
|-----------|--------------------------|-----------------|---------------------------|-----------------|-------------------------------------|
|           | Little Exercise.         | Great Exercise. | Little Exercise.          | Great Exercise. |                                     |
| 21 to 30  | 1·614                    | 1·397           | 1·920                     | 1·719           | 1·758                               |
| 21 ... 40 | 3·574                    | 3·160           | 3·736                     | 3·591           | 3·754                               |
| 21 ... 50 | 5·748                    | 6·176           | 6·842                     | 5·808           | 6·817                               |
| 21 ... 60 | 11·103                   | 11·029          | 11·822                    | 10·348          | 12·418                              |
| 21 ... 70 | 27·126                   | 27·287          | 29·633                    | 24·982          | 29·044                              |



As already stated in respect to the sickness of the In-door occupations, it will be seen that there is in the term of life 21-70 scarcely any difference between the two sections, but in regard to the Out-door occupations requiring little exercise, the same remarkable distinction which characterised the mortality is also observable in the sickness. The rate of sickness is very much in excess of any of the other sections. This is a most important circumstance, not only as affecting friendly societies, but other matters of public interest.

In vol. II. of "The Journal of the Statistical Society" will be found an interesting report by a committee of that society upon the sickness and mortality among the Metropolitan Police Force, during the eight years ending the 31st of December, 1838, being the eight years immediately succeeding the embodiment of that force in the year 1830. The committee in their report have given four very interesting Tables; but the following Table ZZ has been constructed from the original data in a different form from any of those furnished by the committee.

From column 3 it will be seen that the average force for the whole period of eight years was 3313, and the numbers were very nearly stationary during the whole of that period; but it is stated that it was found necessary to recruit annually as many as 1100 new members, the vacancies being created by 1068 who were removed or retired from the force, and 32 who died every year. From the institution of the force to the 31st December, 1838, no less than 14,548 had entered it, and the following shews the proportion entering at various ages:—

|      |           |          |           |           |
|------|-----------|----------|-----------|-----------|
| 32.0 | per cent. | admitted | under age | 26,       |
| 37.5 | ...       | ...      | from age  | 26 to 31, |
| 21.6 | ...       | ...      | ...       | 31 to 36, |
| 6.3  | ...       | ...      | ...       | 36 to 41, |
| 2.6  | ...       | ...      | above     | 41.       |

The ratios of removed and retiring at the corresponding ages were very nearly the same. The average duration of the service of each policeman was consequently about three years, and the average age on admission 28.5 years, and it will be further observed that 69.5 per cent. of all the men entered the force between ages 20 to 31.

The average mortality has been nearly one per cent., or a little under that for the population of England and Wales generally, as given in Table C, but very much greater than that found to prevail in friendly societies, as shewn in Table F, page 32. Attention is now directed to this Table, in consequence of the data forming a marked instance of a class of men undergoing a great amount of bodily labour in the open air. It is stated that each individual of the Police Force has to walk twenty miles every day in going his rounds; besides being obliged to attend charges at the police offices, estimated as equal to an additional five miles, making in all twenty-five miles a day. During two months  
[out of every



TABLE Z Z.

*Shewing the number of Weeks' Sickness among each Division of the Metropolitan Police Force for each Month during the Eight Years ending the 31st December, 1838.*

| District.       | Total Number of the Police Constables during Eight Years. | Average Number per Annum. | January. | February. | March.   | April.   | May.     | June.    | July.    | August.  | September. | October. | November. | December. | Total Sickness during the Eight Years. | Average Sickness per annum per man. |
|-----------------|-----------------------------------------------------------|---------------------------|----------|-----------|----------|----------|----------|----------|----------|----------|------------|----------|-----------|-----------|----------------------------------------|-------------------------------------|
| A Whitehall . . | 937                                                       | 116                       | 89.714   | 53.286    | 64.286   | 92.143   | 67.429   | 69.714   | 60.429   | 67.714   | 74.714     | 68.417   | 69.143    | 94.857    | 871.857                                | 0.9405                              |
| B Westminster . | 1304                                                      | 163                       | 134.286  | 90.571    | 102.429  | 128.143  | 98.571   | 86.000   | 89.429   | 107.000  | 103.429    | 93.571   | 123.571   | 113.714   | 1270.714                               | 0.9745                              |
| C St. James's . | 1469                                                      | 184                       | 224.429  | 174.143   | 187.714  | 202.286  | 179.000  | 151.857  | 148.143  | 163.429  | 157.143    | 158.286  | 177.571   | 173.429   | 2097.429                               | 1.4278                              |
| D Marylebone .  | 1290                                                      | 161                       | 219.286  | 194.286   | 172.857  | 210.143  | 142.143  | 144.429  | 151.571  | 179.429  | 187.429    | 178.857  | 182.429   | 227.143   | 2190.000                               | 1.6977                              |
| E Holborn . .   | 1304                                                      | 163                       | 262.143  | 185.286   | 192.571  | 206.286  | 175.286  | 182.714  | 198.857  | 246.857  | 226.714    | 144.143  | 160.571   | 200.857   | 2382.286                               | 1.8270                              |
| F Covent Garden | 1270                                                      | 159                       | 243.714  | 165.714   | 147.429  | 175.286  | 145.857  | 142.571  | 189.714  | 169.000  | 157.571    | 171.143  | 171.571   | 195.714   | 2075.286                               | 1.6341                              |
| G Finsbury . .  | 1840                                                      | 230                       | 382.143  | 293.857   | 267.286  | 326.857  | 275.286  | 241.429  | 217.571  | 235.429  | 263.571    | 279.714  | 270.000   | 302.286   | 3355.429                               | 1.8236                              |
| H Whitechapel . | 1480                                                      | 185                       | 197.286  | 134.429   | 128.286  | 160.286  | 138.143  | 141.429  | 165.143  | 170.143  | 142.571    | 156.286  | 164.143   | 181.286   | 1879.429                               | 1.2699                              |
| K Stepney . .   | 2320                                                      | 290                       | 386.286  | 261.286   | 297.286  | 287.429  | 272.143  | 249.286  | 257.714  | 307.286  | 263.286    | 266.857  | 343.714   | 347.714   | 3540.286                               | 1.5260                              |
| L Lambeth . .   | 1487                                                      | 186                       | 225.143  | 162.571   | 176.571  | 201.857  | 145.000  | 157.714  | 137.143  | 164.857  | 167.571    | 163.286  | 180.286   | 209.429   | 2091.429                               | 1.4065                              |
| M Southwark .   | 1472                                                      | 184                       | 267.000  | 178.143   | 189.571  | 218.571  | 161.857  | 163.714  | 141.286  | 168.714  | 167.571    | 179.143  | 209.286   | 253.571   | 2298.429                               | 1.5614                              |
| N Islington . . | 2148                                                      | 269                       | 406.143  | 282.857   | 244.571  | 281.857  | 241.714  | 199.286  | 224.286  | 229.714  | 192.571    | 237.714  | 268.000   | 334.857   | 3143.571                               | 1.4681                              |
| P Camberwell .  | 1900                                                      | 238                       | 324.571  | 242.000   | 230.857  | 269.714  | 215.857  | 168.143  | 192.143  | 206.286  | 197.714    | 221.571  | 241.714   | 223.143   | 2733.714                               | 1.4388                              |
| R Greenwich .   | 1656                                                      | 207                       | 315.000  | 209.714   | 197.000  | 200.857  | 166.857  | 170.571  | 178.429  | 244.143  | 205.714    | 217.857  | 189.571   | 235.857   | 2531.571                               | 1.5287                              |
| S Hampstead .   | 1751                                                      | 219                       | 359.571  | 302.857   | 280.286  | 275.571  | 186.000  | 195.714  | 203.143  | 226.714  | 229.714    | 239.000  | 291.571   | 295.714   | 3085.857                               | 1.7623                              |
| T Kensington .  | 1439                                                      | 180                       | 161.286  | 126.857   | 140.286  | 136.429  | 94.571   | 74.143   | 103.286  | 117.286  | 91.000     | 125.714  | 118.000   | 100.429   | 1389.286                               | 0.8655                              |
| V Wandsworth .  | 1450                                                      | 181                       | 233.571  | 176.286   | 200.714  | 196.857  | 152.857  | 30.857   | 132.857  | 156.857  | 144.143    | 145.857  | 145.286   | 141.714   | 1957.857                               | 1.3502                              |
| Total. . .      | 26507                                                     | 3313                      | 4431.571 | 3234.143  | 3220.000 | 3570.571 | 2858.571 | 2569.571 | 2791.143 | 3160.857 | 2972.429   | 3047.429 | 3306.429  | 3631.714  | 38794.429                              | 1.4636                              |
| Average. .      | ...                                                       | ...                       | 553.946  | 404.268   | 402.500  | 446.321  | 357.321  | 321.196  | 348.893  | 395.107  | 371.554    | 380.929  | 413.304   | 453.964   | 4849.304                               |                                     |



out of every three each police constable was on night duty for nine hours each night, from nine o'clock in the evening to six o'clock in the morning, which must be considered excessive; and from the results given in Table ZZ is evidently detrimental to health. On referring to the last column of this Table it will be seen that the average amount of sickness was 1.4636 weeks to each member of the force, while according to Table V, the results for the City Districts should not have exceeded 1.100 per cent., and for the average of the three districts combined not more than 0.910 per cent.

It will be seen from an inspection of the results in the last columns of this Table that the rate of sickness has differed widely in the various divisions of the force. In the Kensington division the sickness per annum was only 0.8655 weeks per annum to each member, while, in the Holborn division, the sickness was as high as 1.8270 weeks yearly. In pages 166-8 *ante*, will be found several interesting illustrations of the effect of the various seasons of the year on the amount of mortality, and the Table now under consideration furnishes important information on the influence which the different seasons of the year have on the amount of sickness. Nearly the whole of the Police Force was under the age of 40, and therefore the results in Table ZZ should be compared with those in the second column of the first Abstract in page 168 *ante*.

|                                                       | Mortality (see page 168).    | Sickness (see Table ZZ).    |
|-------------------------------------------------------|------------------------------|-----------------------------|
| Quarter of least Mortality and Sickness . . . . . }   | April, May, June.            | June, July, May.            |
| Quarter, second in intensity. . }                     | July, August, September.     | September, October, August. |
| Quarter, third in intensity . . }                     | January, February, March.    | March, February, November.  |
| Quarter of highest Mortality and Sickness . . . . . } | October, November, December. | April, December, January.   |

Considering all the circumstances as to time and place, and that the one series of observations relate to Mortality, and the other to Sickness only, there is a much greater correspondence between the two classes of results than might have been expected. Table ZZ will be useful in illustrating the marked fluctuations due to the seasons of the year in the different districts of the Metropolis, and it has an important public interest on many questions now pending as to the efficiency of the Police Force, and the trying nature of the duties the members of that force are called on to discharge. A service in which the members cannot remain on the average, more than three years, must be really very irksome and laborious, and if recent facts confirm the results of the eight years' experience embodied in Table ZZ, greater credit is due to those connected with the Metropolitan Police Force than the public in its present temper seems disposed to accord to them.



For the purpose of a medical inquiry conducted by Mr. Maclaren two or three years since, it was thought important to make a similar investigation to that, the results of which are given in pp. 454-8 *ante*, into the effect of sedentary occupations on female life, and the next Table exhibits the results arrived at.

TABLE A B.

*Sickness and Mortality amongst Female Occupations according to the data described in pp. 17-9 ante—  
The Sickness expressed in Weeks.*

| Age.      | ACTIVE OCCUPATIONS :—<br>Charwomen and Washerwomen, Cooks, Domestic Servants,<br>Housewives, Laundresses, &c. |         |                        |           |                        | SEDENTARY OCCUPATIONS :—<br>Dressmakers, Lacemakers, Milliners, Sempstresses, Shoe-<br>binders, Straw-bonnet-makers, &c. |         |                        |           |                        |
|-----------|---------------------------------------------------------------------------------------------------------------|---------|------------------------|-----------|------------------------|--------------------------------------------------------------------------------------------------------------------------|---------|------------------------|-----------|------------------------|
|           | Population.                                                                                                   | Deaths. | Mortality<br>per Cent. | Sickness. | Sickness<br>per Annum. | Population                                                                                                               | Deaths. | Mortality<br>per Cent. | Sickness. | Sickness<br>per Annum. |
| 16 to 20  | 958                                                                                                           | 9       | ·939                   | 807·989   | ·843                   | 913                                                                                                                      | 9       | ·986                   | 1217·713  | 1·334                  |
| 21 ... 25 | 2469                                                                                                          | 16      | ·648                   | 2841·987  | 1·151                  | 1577                                                                                                                     | 16      | 1·015                  | 2826·420  | 1·792                  |
| 26 ... 30 | 3087                                                                                                          | 33      | 1·069                  | 5654·562  | 1·832                  | 1127                                                                                                                     | 12      | 1·065                  | 2423·564  | 2·150                  |
| 31 ... 35 | 2958                                                                                                          | 11      | ·372                   | 4746·987  | 1·605                  | 813                                                                                                                      | 8       | ·984                   | 990·423   | 1·218                  |
| 36 ... 40 | 2858                                                                                                          | 12      | ·420                   | 3804·136  | 1·331                  | 491                                                                                                                      | 8       | 1·629                  | 890·998   | 1·815                  |
| 41 ... 45 | 2602                                                                                                          | 32      | 1·230                  | 4080·420  | 1·568                  | 414                                                                                                                      | 7       | 1·691                  | 665·424   | 1·607                  |
| 46 ... 50 | 2100                                                                                                          | 30      | 1·429                  | 3858·570  | 1·837                  | 323                                                                                                                      | 4       | 1·238                  | 1541·283  | 4·772                  |
| 51 ... 55 | 1861                                                                                                          | 20      | 1·075                  | 3259·287  | 1·751                  | 209                                                                                                                      | 6       | 2·871                  | 829·854   | 3·971                  |
| 56 ... 60 | 1354                                                                                                          | 26      | 1·182                  | 2560·569  | 1·891                  | 66                                                                                                                       |         |                        | 23·570    | ·357                   |
| 61 ... 65 | 747                                                                                                           | 17      | 2·276                  | 2079·568  | 2·784                  | 25                                                                                                                       |         |                        | 40·000    | 1·600                  |
| 66 ... 70 | 325                                                                                                           | 9       | 2·769                  | 2580·000  | 7·938                  | 9                                                                                                                        |         |                        | 10·000    | 1·111                  |
| 71 ... 75 | 102                                                                                                           | 7       | 6·862                  | 3431·000  | 3·363                  | 19                                                                                                                       |         |                        | 12·000    | ·632                   |
| Total .   | 21421                                                                                                         | 225     | 1·050                  | 39705·075 | 1·853                  | 5986                                                                                                                     | 70      | 1·169                  | 11471·249 | 1·916                  |

The following is a condensed Abstract of the sickness shewn in the preceding Table, from which it appears that until above 60 years of age the sickness of both sections of occupation is in excess of that of the males for the whole of England and Wales. Beyond the age of 60, the facts in the preceding Table are not sufficiently numerous to admit of comparison. It will be further seen in the following Abstract, that the sickness in the sedentary occupations is greatly in excess of that in the others.

## FEMALE TRADES.

*Sum of the rate of Sickness per Annum at each quinquennial term of life.—expressed in Weeks.*

| Age.      | Active Occupations. | Sedentary<br>Occupations. | England and Wales. |
|-----------|---------------------|---------------------------|--------------------|
| 21 to 30  | 2·983               | 3·942                     | 1·758              |
| 21 ... 40 | 5·919               | 6·975                     | 3·754              |
| 21 ... 50 | 9·324               | 13·354                    | 6·817              |
| 21 ... 60 | 12·966              | 17·682                    | 12·418             |



In relation to the ratio of sickness amongst female lives generally, without distinction of occupation, it is necessary to make some observations.

In many societies, such as the Essex, the Wilts, and others, the rate of sickness which prevails among the female members greatly exceeds that among the other sex. On the other hand there are other societies, such as the Female Society at Mold, established by Archdeacon Clough, in which the sickness is remarkably below the average rate for males generally in benefit societies. However, in the materials furnished in connection with the inquiry which gave rise to this Contribution, the results for female life shewed in the aggregate, a somewhat higher rate of sickness than the ratio for male lives, although falling much below the rate shewn in the Essex and the Wilts Societies. The following Table shews the results for female lives for the whole of England and Wales as compared with the corresponding results for the male sex.

TABLE A C.

*Sickness in England and Wales according to the data described in pp. 17-9 ante—expressed in weeks.*

| Age.      | FEMALES.                            |                                       |                      | MALES.               | Difference<br>per Cent. | Age.      |
|-----------|-------------------------------------|---------------------------------------|----------------------|----------------------|-------------------------|-----------|
|           | Number of Years<br>exposed to risk. | Total amount of<br>Sickness in Weeks. | Average<br>Sickness. | Average<br>Sickness. |                         |           |
| 10 to 15  | 19                                  | 13·000                                | ·6842                | ·7530                | — 9·137                 | 10 to 15  |
| 16 ... 20 | 504                                 | 278·143                               | ·9149                | ·8288                | + 10·388                | 16 ... 20 |
| 21 ... 25 | 3140                                | 2590·424                              | ·8250                | ·8564                | — 3·662                 | 21 ... 25 |
| 26 ... 30 | 8852                                | 9467·855                              | 1·0693               | ·9014                | + 18·626                | 26 ... 30 |
| 31 ... 35 | 11538                               | 14323·713                             | 1·2415               | ·9248                | + 34·245                | 31 ... 35 |
| 36 ... 40 | 10828                               | 14907·566                             | 1·3786               | 1·0718               | + 28·625                | 36 ... 40 |
| 41 ... 45 | 10058                               | 15131·282                             | 1·5044               | 1·3443               | + 11·909                | 41 ... 45 |
| 46 ... 50 | 8639                                | 15501·424                             | 1·7944               | 1·7185               | + 4·417                 | 46 ... 50 |
| 51 ... 55 | 7423                                | 21419·137                             | 2·8720               | 2·3231               | + 23·628                | 51 ... 55 |
| 56 ... 60 | 7080                                | 19033·710                             | 2·6884               | 3·2773               | — 17·969                | 56 ... 60 |
| 61 ... 65 | 4929                                | 16413·859                             | 3·3301               | 5·4983               | — 39·435                | 61 ... 65 |
| 66 ... 70 | 3076                                | 13061·852                             | 4·2464               | 11·1279              | — 61·839                | 66 ... 70 |
| 71 ... 75 | 1488                                | 15182·424                             | 10·2032              | 18·4059              | — 44·567                | 71 ... 75 |
| 76 ... 80 | 668                                 | 9611·849                              | 14·3889              | 26·0566              | — 44·779                | 76 ... 80 |
| 81 ... 85 | 277                                 | 4727·855                              | 20·8276              | 28·2565              | — 26·317                | 81 ... 85 |
| 86 ... 90 | 88                                  | 1794·712                              | 20·3943              | 32·4940              | — 37·238                | 86 ... 90 |
| 91 ... 95 | 16                                  | 328·000                               | 20·5000              | 22·9714              | — 10·759                | 91 ... 95 |
| Total     | 78623                               | 173786·805                            | 2·2104               |                      |                         |           |

In the Wilts Society the sickness amongst female lives exceeds that of the other sex about 50 per cent., and the following gives the ratio for the Essex Provident Society:—



## INFLUENCE OF LOCALITY ON SICKNESS.

TABLE A D.

*Sickness in the Essex Provident Society.*

| Age.      | FEMALES.                                                             |                                                          |                                                          | MALES.                                                   |                      | Age.      |
|-----------|----------------------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------|-----------|
|           | Number of years which Members have been exposed to risk of sickness. | Total Amount of Sickness experienced expressed in weeks. | Average number of weeks' sickness to each Member yearly. | Average number of weeks' sickness to each Member yearly. | Difference per Cent. |           |
| 21 to 25  | 364.5                                                                | 536.386                                                  | 1.471                                                    | 1.291                                                    | +13.943              | 21 to 25  |
| 26 ... 30 | 437.5                                                                | 1084.858                                                 | 2.480                                                    | 1.346                                                    | +84.250              | 26 ... 30 |
| 31 ... 35 | 369.0                                                                | 967.571                                                  | 2.622                                                    | 1.439                                                    | +82.210              | 31 ... 35 |
| 36 ... 40 | 327.5                                                                | 789.999                                                  | 2.412                                                    | 1.534                                                    | +57.236              | 36 ... 40 |
| 41 ... 45 | 242.0                                                                | 416.858                                                  | 1.723                                                    | 1.712                                                    | + 0.643              | 41 ... 45 |
| 46 ... 50 | 152.5                                                                | 188.428                                                  | 1.236                                                    | 1.821                                                    | -32.135              | 46 ... 50 |
| 51 ... 55 | 73.0                                                                 | 307.715                                                  | 4.215                                                    | 3.229                                                    | +30.536              | 51 ... 55 |
| 56 ... 60 | 36.5                                                                 | 58.430                                                   | 1.601                                                    | 4.869                                                    | -67.112              | 56 ... 60 |
| 61 ... 65 | 15.0                                                                 | 29.143                                                   | 1.943                                                    | 4.126                                                    | -52.908              | 61 ... 65 |
| 66 ... 70 | 3.5                                                                  | 21.286                                                   | 6.082                                                    | 15.969                                                   | -61.914              | 66 ... 70 |
| Total . . | 2021.0                                                               | 4400.674                                                 | 2.177                                                    |                                                          |                      |           |

The following Abstract of the two preceding Tables sufficiently shews that in female life, as well as in male life, the rate of sickness differs very widely: and the remarks made in respect to male life are, to a great extent, applicable to female life also, but from the recorded experience of the latter sex being more limited, the practical application of the results is rendered more difficult.

TABLE A E.

*Rate of Sickness in the Essex Provident Society, and in the Friendly Societies of England and Wales generally.*

## FEMALES.

| Age.      | Essex Society. | England and Wales. | Difference per Cent. |
|-----------|----------------|--------------------|----------------------|
| 21 to 25  | 1.471          | 0.825              | + 78.303             |
| 26 ... 30 | 2.480          | 1.069              | + 132.000            |
| 31 ... 35 | 2.622          | 1.242              | + 111.111            |
| 36 ... 40 | 2.412          | 1.379              | + 74.909             |
| 41 ... 45 | 1.723          | 1.504              | + 14.561             |
| 46 ... 50 | 1.236          | 1.794              | - 31.104             |
| 51 ... 55 | 4.215          | 2.872              | + 46.762             |
| 56 ... 60 | 1.601          | 2.688              | - 40.439             |

Having thus brought under consideration these facts in regard to the experience of females, it is unnecessary to follow them up with any remarks on this particular question, further than simply to caution the promoters of benefit clubs against the indiscriminate use of these materials by societies which admit female members.

While these sheets have been passing through the press I have received a copy of some notes on the Mortality and Sickness found to prevail amongst the Ancient Order of



Foresters, compiled from Returns for the three years 1850-2, obtained from the various Courts of that Order. They have been analysed by Mr. William Watkins, P.C.R., of Court "Star of Sussex," No. 1914, Brighton. In this publication by the Ancient Order of Foresters there are many points of interest to which reference might be made if there were sufficient space remaining for that purpose, but it will now be impossible to do more than give the following condensed Abstract of the results.

TABLE A F.

*Sickness according to the records of the Ancient Order of Foresters, for the Years 1850-2.*

| Age.      | Number liable to Sickness. | Total Number of Days' Sickness stated to have occurred. | Sickness to each person in |        | Age.      |
|-----------|----------------------------|---------------------------------------------------------|----------------------------|--------|-----------|
|           |                            |                                                         | Days.                      | Weeks. |           |
| 20        | 578                        | 2720                                                    | 4.706                      | .672   | 20        |
| 21 to 25  | 2758                       | 15417                                                   | 5.590                      | .799   | 21 to 25  |
| 26 ... 30 | 4281                       | 28367                                                   | 6.626                      | .947   | 26 ... 30 |
| 31 ... 35 | 4073                       | 25639                                                   | 6.295                      | .899   | 31 ... 35 |
| 36 ... 40 | 3862                       | 29705                                                   | 7.692                      | 1.099  | 36 ... 40 |
| 41 ... 45 | 2900                       | 23593                                                   | 8.136                      | 1.162  | 41 ... 45 |
| 46 ... 50 | 2219                       | 21079                                                   | 9.499                      | 1.357  | 46 ... 50 |
| 51 ... 55 | 1068                       | 14543                                                   | 13.617                     | 1.945  | 51 ... 55 |
| 56 ... 60 | 551                        | 8564                                                    | 15.543                     | 2.220  | 56 ... 60 |
| 61 ... 65 | 174                        | 3737                                                    | 21.477                     | 3.068  | 61 ... 65 |
| 66 ... 70 | 146                        | 3096                                                    | 21.203                     | 3.029  | 66 ... 70 |
| Total . . | 22610                      | 176460                                                  | 7.805                      | 1.115  | Total.    |

From this Table it will be seen that until age 40 the sickness of the Foresters is quite as high as the rates in Table E, from age 40 to 50 somewhat less, but after the age of 50 the data are of so limited extent as to be wholly inapplicable. These data are of very meagre extent compared with those of the Odd Fellows, but it is most satisfactory to find that the Order is now so alive to its interests as to enforce such an investigation into its affairs as must necessarily have taken place in carrying out this inquiry. It is quite impossible that it can result otherwise than in the most beneficial results. Whenever sufficient attention is drawn to the nature and extent of the liabilities of the Order by the publication of its own experience, members will ponder over them and eventually approve of such measures as are calculated to place the Order on a good and sound financial basis.

For many purposes it is important to know the ratio of persons constantly sick, in a society or particular district. In the following Table the figures in the second column are deduced from Table E, pp. 26-7, and represent the ratio of persons constantly



sick for the whole of England and Wales. The figures in the second column will of course follow the same law as those in Table E itself.

TABLE A G.

*Ratio constantly Sick at various terms of Life.*

| Age.       | Number per<br>Cent. constantly<br>Sick. | Number of Males continually Sick<br>in England and Wales. |          | Age.      |
|------------|-----------------------------------------|-----------------------------------------------------------|----------|-----------|
|            |                                         | 1841.                                                     | 1851.    |           |
| 11 to 15   | 1.4481                                  | 12739.40                                                  | 14003.23 | 11 to 15  |
| 16 ... 20  | 1.5938                                  | 12447.05                                                  | 14133.99 | 16 ... 20 |
| 21 ... 25  | 1.6469                                  | 22531.85                                                  | 23932.38 | 21 ... 30 |
| 26 ... 30  | 1.7335                                  |                                                           |          |           |
| 31 ... 35  | 1.7785                                  |                                                           |          |           |
| 36 ... 40  | 2.0611                                  | 19178.80                                                  | 22406.08 | 31 ... 40 |
| 41 ... 45  | 2.5852                                  | 22042.94                                                  | 25698.57 | 41 ... 50 |
| 46 ... 50  | 3.3048                                  |                                                           |          |           |
| 51 ... 55  | 4.4675                                  |                                                           |          |           |
| 56 ... 60  | 6.3025                                  | 26735.18                                                  | 32527.61 | 51 ... 60 |
| 61 ... 65  | 10.5736                                 | 52688.58                                                  | 59265.95 | 61 ... 70 |
| 66 ... 70  | 21.4000                                 |                                                           |          |           |
| 71 ... 75  | 35.3960                                 |                                                           |          |           |
| 76 ... 80  | 50.1088                                 | 67414.13                                                  | 74489.71 | 71 ... 80 |
| 81 ... 85  | 54.3587                                 | 24084.54                                                  | 23624.75 | 81 ... 90 |
| 86 ... 90  | 62.4885                                 |                                                           |          |           |
| 91 ... 95  | 44.1758                                 |                                                           |          |           |
| 96 ... 100 |                                         | 1319.09                                                   | 1338.53  | 91 ... 95 |

From the third column of the preceding Table, it will be seen that of the male population above 10 years of age, 261182 or 4.5257 per cent. were constantly sick in 1841, and from the fourth column it will be found, that taking the population as given in the census of 1851, there must have been in that year 291421 constantly sick above 10 years of age, or on the average 4.4325 per cent. constantly sick. There are many important applications which may be made of this Table, but its construction is so simple that the ratios according to any other classes of data may be easily deduced.

At this place it may be again stated, that in applying the preceding results to individual classes, or in a few instances only, it should not be expected that they will in every case be confirmed. Nothing short of a refined classification is calculated to meet the peculiar aspect of all the cases presenting themselves. A review of Table V will shew the wide distinction which prevails between the ratio of sickness in the Rural, Town, and City Districts; and in particular trades or occupations the amount of sickness is sometimes double that in other employments. In sickness, therefore, as well as in mortality, it is obvious that general results can be but of little practical value. Suppose



it were attempted to conduct societies in Liverpool, or in any other large city in England, on the terms that would be adequate for societies in the Rural Districts of Kent and Essex—it is manifest that they could not be of long duration.

Here it may be also well to state, that if in any public inquiry it should be attempted to ascribe the increased amount of sickness in the Town Districts to the less healthy nature of the districts, or their peculiar local influence on health, the conclusion would certainly be fallacious. Arguments precisely similar to those made use of in reference to the mortality of those districts, will explain the differences in the ratio of sickness in the same places; and it is therefore to be inferred, that whatever sanitary regulations may be carried out for promoting the health of towns, still the wide distinction between the rates of sickness and mortality in particular districts will not disappear. The cause of that difference is beyond the reach of any sanitary measure; and unless a change were to take place in the character and machinery of the manufactures of a town, by which the workmen would be habituated to less restrained, but more natural and complete physical exercises, no improvement in the state of health is to be looked for.

The evils, which relate to health, and are represented, by some writers, to exist to so frightful an extent, and to connect themselves with defective sewerage, filthy streets, and ill-planned houses, are certainly overstated by them. The data brought forward have generally been of the most indefinite and insufficient nature; and when, in connection with this, the erroneous methods employed, and the promiscuous manner in which their figures are generally combined, are kept in view, it must seem surprising that the thinking and intelligent portion of the community should have given their opinions any credence, or believed their conclusions entitled to so much weight.

Perhaps no statistical facts are better established than the duration of life among the middle and upper classes of this country; and if the data brought forward in this paper be received as of sufficient merit to represent the duration of life among the working classes, it will then appear clear that any important change to be hoped for in the value of life in the Town Districts, must be effected through other means than sanitary regulations.

Those persons who purchase Government Annuities, and have dealings with Assurance Companies, are certainly beyond the reach of any improvements to be introduced by local regulations; and if cleanliness of habit, comfort of dwellings, and fresh air, be of themselves powerful elements in raising the standard of life, their influence should be felt among that class of persons. But what are the actual results? The poor workmen inhabiting the miserable streets of our large towns, and inhaling their supposed noxious vapours, are actually longer lived than the affluent and upper classes, whose easy circumstances enable them to inhabit comparatively the palaces of the kingdom.



It is evident, from the great disparity in the value of life among different classes of workmen, whose conditions as to whatever is within the scope of public sanitary measures are the same, that other elements must exist having a powerful influence on the duration of life. It will further appear, that by viewing the various classes of society more in connection with the physical exercises to which they are habituated, than in connection with their moral position and rank in society, and consequently with their sanitary condition, a better clue will be found to the differences in the duration of life. It is not to be expected that any arrangements whatever as to the drainage and planning of streets are likely to add to the longevity of a Tailor; but if it were possible to give to his frame the physical exercises of a Ploughman, 20 per cent. would be added to the duration of his life. Neither is it to be thought that the Plumber, Painter, and Glazier is to be relieved from the poison of the metallic emanations to which he is exposed; nor that the Clerk can inhale the fresh air, and indulge in those exercises necessary to develop his physical constitution, while he follows the drudgeries of the counting-house. It is an aggregation of these, and other employments similarly conditioned, which make up the excessive mortality of our large towns; and since it has been shewn in the preceding pages, that this class of lives is also less healthy even in the Country Districts, and that the Town populations are chiefly made up of persons following such occupations, the legitimate result to be expected is a shorter duration of life in Towns, independent of any local influence on health. If improvements and changes are to be effected in the sanitary regulations of our large towns and cities, let them at once be carried out—not upon the necessity of such municipal innovations to avert a pestilential havoc in human life—but on the true merits of the question—the comforts, conveniences, and elevation of taste, and moral purity, thence arising.

---



## RATES AND CONTRIBUTIONS OF FRIENDLY SOCIETIES.

---

THE influence of the preceding results on the Rates and Contributions of Friendly Societies is perhaps that which generally most concerns the members of those institutions, and it is proposed to add a few remarks bearing on this subject.

The first point to which attention will be directed is the Table at page 470, being the Value of Annuities, according to the Rates of Mortality, developed in this inquiry, for Friendly Societies in the Rural, Town, and City Districts of England and Wales,—for the average of these districts combined,—and also for Friendly Societies in Scotland.

The rate of interest assumed in the following calculations is three per cent. per annum. In almost every other calculation extant for the purposes of friendly societies, a higher rate of interest has been adopted; but a careful investigation of the returns on this point, as given in the Schedules referred to at page 18 *ante*, has shewn that in practice a higher rate of interest is not realised by societies.

The Commissioners for the Reduction of the National Debt have hitherto allowed friendly societies £3 16s. 0½d. per cent.; but even in the cases where this mode of investment has been taken advantage of, the difficulty of collecting all the funds at the moment they fall due, and of immediately employing them in the Government Stock, together with the balance, large as compared with the whole amount of the Societies' funds, usually kept in hand to meet approaching liabilities, renders it difficult to make much beyond three per cent\*. It is intended, on another occasion, to publish an account of the Money Transactions of those societies; this and some other points of interest will then be more fully entered on.

The distinguishing features of the rates of mortality in the respective districts, will of course develope themselves also in the same order or relation in the value of  
[annuities

\* The 13th and 14th Victoria, c. 115, limits the rate of interest to 3 per cent. to such societies as invest their money with the Commissioners for the reduction of the National Debt.







TABLE A I.  
*Value of Deferred Annuities of £1 to commence at Age 70—Three per Cent.—Friendly Societies—Males.*

| Age. | ENGLAND AND WALES. |                 |                 |                                  | Age. | SCOTLAND.        |                 |                 |                                  |
|------|--------------------|-----------------|-----------------|----------------------------------|------|------------------|-----------------|-----------------|----------------------------------|
|      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. |      | Rural Districts. | Town Districts. | City Districts. | Rural, Town, and City Districts. |
| 10   | ·65112             | ·42290          | ·38922          | ·56105                           | 40   | 1·91180          | 1·23160         | 1·20038         | 1·65581                          |
| 11   | ·67220             | ·43679          | ·40249          | ·57933                           | 41   | 1·98498          | 1·28084         | 1·25396         | 1·72164                          |
| 12   | ·69396             | ·45113          | ·41622          | ·59820                           | 42   | 2·06122          | 1·33252         | 1·31085         | 1·79063                          |
| 13   | ·71657             | ·46599          | ·43044          | ·61780                           | 43   | 2·14079          | 1·38687         | 1·37118         | 1·86301                          |
| 14   | ·74022             | ·48144          | ·44522          | ·63825                           | 44   | 2·22395          | 1·44419         | 1·43505         | 1·93902                          |
| 15   | ·76513             | ·49756          | ·46062          | ·65971                           | 45   | 2·31101          | 1·50478         | 1·50262         | 2·01895                          |
| 16   | ·79152             | ·51444          | ·47669          | ·68235                           | 46   | 2·40231          | 1·56895         | 1·57398         | 2·10308                          |
| 17   | ·81967             | ·53217          | ·49352          | ·70637                           | 47   | 2·49820          | 1·63714         | 1·64923         | 2·19172                          |
| 18   | ·84952             | ·55074          | ·51120          | ·73173                           | 48   | 2·59917          | 1·70967         | 1·72882         | 2·28534                          |
| 19   | ·88099             | ·57013          | ·52966          | ·75840                           | 49   | 2·70581          | 1·78690         | 1·81324         | 2·38445                          |
| 20   | ·91400             | ·59034          | ·54896          | ·78632                           | 50   | 2·81868          | 1·86923         | 1·90308         | 2·48959                          |
| 21   | ·94843             | ·61132          | ·56910          | ·81541                           | 51   | 2·93849          | 1·95716         | 1·99894         | 2·60140                          |
| 22   | ·98414             | ·63304          | ·59008          | ·84561                           | 52   | 3·06602          | 2·05114         | 2·10157         | 2·72055                          |
| 23   | 1·02115            | ·65558          | ·61192          | ·87697                           | 53   | 3·20187          | 2·15215         | 2·21126         | 2·84777                          |
| 24   | 1·05954            | ·67900          | ·63470          | ·90953                           | 54   | 3·34673          | 2·26133         | 2·32836         | 2·98381                          |
| 25   | 1·09932            | ·70339          | ·65852          | ·94337                           | 55   | 3·50134          | 2·37996         | 2·45326         | 3·12949                          |
| 26   | 1·14054            | ·72882          | ·68500          | ·97854                           | 56   | 3·66650          | 2·50954         | 2·59217         | 3·28575                          |
| 27   | 1·18327            | ·75542          | ·71131          | 1·01511                          | 57   | 3·84311          | 2·65177         | 2·72759         | 3·45365                          |
| 28   | 1·22754            | ·78322          | ·73894          | 1·05316                          | 58   | 4·03232          | 2·80777         | 2·87958         | 3·63438                          |
| 29   | 1·27343            | ·81228          | ·76790          | 1·09275                          | 59   | 4·23536          | 2·97887         | 3·04474         | 3·82931                          |
| 30   | 1·32102            | ·84266          | ·79819          | 1·13398                          | 60   | 4·45356          | 3·16628         | 3·22609         | 4·04001                          |
| 31   | 1·37039            | ·87441          | ·82984          | 1·17690                          | 61   | 4·68840          | 3·37159         | 3·42727         | 4·26812                          |
| 32   | 1·42161            | ·90759          | ·86301          | 1·22161                          | 62   | 4·94166          | 3·59644         | 3·65267         | 4·51560                          |
| 33   | 1·47479            | ·94226          | ·89785          | 1·26821                          | 63   | 5·21719          | 3·84421         | 3·90544         | 4·78608                          |
| 34   | 1·53003            | ·97846          | ·93449          | 1·31676                          | 64   | 5·51939          | 4·11891         | 4·18914         | 5·08364                          |
| 35   | 1·58746            | 1·01625         | ·97311          | 1·36739                          | 65   | 5·85372          | 4·42512         | 4·50804         | 5·41330                          |
| 36   | 1·64720            | 1·05568         | 1·01388         | 1·42021                          | 66   | 6·22638          | 4·76857         | 4·86701         | 5·78105                          |
| 37   | 1·70939            | 1·09679         | 1·05679         | 1·47529                          | 67   | 6·64502          | 5·14782         | 5·27168         | 6·19381                          |
| 38   | 1·77413            | 1·13973         | 1·10204         | 1·53282                          | 68   | 7·11758          | 5·59187         | 5·73009         | 6·66056                          |
| 39   | 1·84517            | 1·18461         | 1·14982         | 1·59294                          | 69   | 7·65366          | 6·11056         | 6·25203         | 7·19217                          |



TABLE A K.

*Value of Temporary Annuities of £1 to continue till Age 70.—Three per Cent.—Friendly Societies.—Males.*

| Age. | ENGLAND AND WALES. |                 |                 |                                  | Age. | ENGLAND AND WALES. |                 |                 |                                  | SCOTLAND.                        |                                  |
|------|--------------------|-----------------|-----------------|----------------------------------|------|--------------------|-----------------|-----------------|----------------------------------|----------------------------------|----------------------------------|
|      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. |      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. | Rural, Town, and City Districts. | Rural, Town, and City Districts. |
| 10   | 23.96250           | 23.85110        | 23.04221        | 23.79658                         | 40   | 16.69272           | 15.77990        | 15.25823        | 16.24536                         | 15.9451                          | 15.9451                          |
| 11   | 23.73827           | 23.63430        | 22.82783        | 23.57769                         | 41   | 16.33167           | 15.45160        | 14.93937        | 15.89136                         | 15.6022                          | 15.6022                          |
| 12   | 23.50667           | 23.41040        | 22.60628        | 23.34580                         | 42   | 15.95892           | 15.07503        | 14.61721        | 15.52808                         | 15.2488                          | 15.2488                          |
| 13   | 23.27260           | 23.18151        | 22.37899        | 23.11038                         | 43   | 15.57503           | 14.68989        | 14.28985        | 15.15571                         | 14.8788                          | 14.8788                          |
| 14   | 23.04073           | 22.95016        | 22.14733        | 22.87540                         | 44   | 15.18007           | 14.29703        | 13.92013        | 14.77410                         | 14.4990                          | 14.4990                          |
| 15   | 22.81592           | 22.71854        | 21.91305        | 22.64459                         | 45   | 14.77431           | 13.89690        | 13.61262        | 14.38313                         | 14.1115                          | 14.1115                          |
| 16   | 22.60303           | 22.48901        | 21.67785        | 22.42179                         | 46   | 14.35799           | 13.48951        | 13.25909        | 13.98247                         | 13.7188                          | 13.7188                          |
| 17   | 22.40673           | 22.26418        | 21.44306        | 22.21100                         | 47   | 13.93110           | 13.14373        | 12.89297        | 13.57174                         | 13.3227                          | 13.3227                          |
| 18   | 22.22273           | 22.04101        | 21.21115        | 22.00852                         | 48   | 13.49414           | 12.65508        | 12.51518        | 13.14148                         | 12.9204                          | 12.9204                          |
| 19   | 22.04606           | 21.81742        | 20.97714        | 21.81063                         | 49   | 13.04779           | 12.22674        | 12.12629        | 12.72181                         | 12.5092                          | 12.5092                          |
| 20   | 21.87205           | 21.59052        | 20.74158        | 21.61349                         | 50   | 12.59206           | 11.79012        | 11.72707        | 12.28282                         | 12.0864                          | 12.0864                          |
| 21   | 21.69605           | 21.35783        | 20.50238        | 21.41336                         | 51   | 12.12731           | 11.34471        | 11.31780        | 11.83445                         | 11.6494                          | 11.6494                          |
| 22   | 21.51275           | 21.11682        | 20.25825        | 21.20639                         | 52   | 11.64361           | 10.88943        | 10.89887        | 11.37645                         | 11.1950                          | 11.1950                          |
| 23   | 21.32189           | 20.86882        | 20.00830        | 20.99275                         | 53   | 11.16998           | 10.42572        | 10.46774        | 10.90853                         | 10.7261                          | 10.7261                          |
| 24   | 21.12338           | 20.61418        | 19.75319        | 20.72235                         | 54   | 10.67531           | 9.95437         | 10.02210        | 10.42962                         | 10.2443                          | 10.2443                          |
| 25   | 20.91647           | 20.35461        | 19.49448        | 20.54503                         | 55   | 10.16851           | 9.47682         | 9.55974         | 9.93883                          | 9.7513                           | 9.7513                           |
| 26   | 20.70082           | 20.09062        | 19.27816        | 20.31086                         | 56   | 9.64814            | 8.99281         | 9.07183         | 9.43538                          | 9.2480                           | 9.2480                           |
| 27   | 20.47633           | 19.82371        | 19.01876        | 20.02147                         | 57   | 9.11289            | 8.50249         | 8.57401         | 8.91719                          | 8.7363                           | 8.7363                           |
| 28   | 20.24246           | 19.55325        | 18.75753        | 19.82226                         | 58   | 8.56154            | 8.00267         | 8.05180         | 8.38384                          | 8.2136                           | 8.2136                           |
| 29   | 19.99924           | 19.27884        | 18.49264        | 19.56753                         | 59   | 7.99264            | 7.49035         | 7.51362         | 7.83352                          | 7.6786                           | 7.6786                           |
| 30   | 19.74661           | 18.99982        | 18.23217        | 19.35277                         | 60   | 7.40441            | 6.96158         | 6.96113         | 7.23756                          | 7.1294                           | 7.1294                           |
| 31   | 19.48470           | 18.71577        | 17.94457        | 19.03640                         | 61   | 6.79486            | 6.41301         | 6.39522         | 6.67369                          | 6.5633                           | 6.5633                           |
| 32   | 19.21282           | 18.42601        | 17.66199        | 18.75968                         | 62   | 6.16192            | 5.84068         | 5.81582         | 6.06066                          | 5.9777                           | 5.9777                           |
| 33   | 18.93161           | 18.12984        | 17.37485        | 18.47516                         | 63   | 5.50547            | 5.24307         | 5.21827         | 5.42367                          | 5.3681                           | 5.3681                           |
| 34   | 18.64065           | 17.82634        | 17.08401        | 18.18255                         | 64   | 4.82436            | 4.61771         | 4.59735         | 4.76088                          | 4.7298                           | 4.7298                           |
| 35   | 18.34027           | 17.51705        | 16.79005        | 17.88172                         | 65   | 4.01659            | 3.96102         | 3.94733         | 4.06961                          | 4.0578                           | 4.0578                           |
| 36   | 18.03053           | 17.19669        | 16.49348        | 17.57230                         | 66   | 3.37866            | 3.26845         | 3.26164         | 3.34607                          | 3.3466                           | 3.3466                           |
| 37   | 17.71127           | 16.86643        | 16.19158        | 17.25397                         | 67   | 2.60584            | 2.52839         | 2.53283         | 2.58498                          | 2.5906                           | 2.5906                           |
| 38   | 17.38208           | 16.52667        | 15.88473        | 16.92671                         | 68   | 1.79116            | 1.74648         | 1.75309         | 1.77978                          | 1.7855                           | 1.7855                           |
| 39   | 17.04277           | 16.17745        | 15.57357        | 16.59057                         | 69   | .92607             | .90848          | .91278          | .92183                           | .9248                            | .9248                            |











TABLE A N.

*Temporary Annual Premium to continue till Age 70 for £1 at Death—Three per Cent.—Friendly Societies—Males.*

| Age. | ENGLAND AND WALES. |                 |                 |                                  | Age. | ENGLAND AND WALES. |                 |                 |                                  | SCOTLAND.                        |                                  |
|------|--------------------|-----------------|-----------------|----------------------------------|------|--------------------|-----------------|-----------------|----------------------------------|----------------------------------|----------------------------------|
|      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. |      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. | Rural, Town, and City Districts. | Rural, Town, and City Districts. |
| 10   | ·01017             | ·01062          | ·01200          | ·01054                           | 40   | ·02425             | ·02833          | ·03023          | ·02606                           | ·02711                           | ·02711                           |
| 11   | ·01051             | ·01095          | ·01235          | ·01088                           | 41   | ·02524             | ·02939          | ·03132          | ·02711                           | ·02816                           | ·02816                           |
| 12   | ·01086             | ·01130          | ·01272          | ·01123                           | 42   | ·02630             | ·03067          | ·03246          | ·02822                           | ·02928                           | ·02928                           |
| 13   | ·01121             | ·01167          | ·01311          | ·01160                           | 43   | ·02744             | ·03203          | ·03367          | ·02941                           | ·03051                           | ·03051                           |
| 14   | ·01157             | ·01204          | ·01352          | ·01198                           | 44   | ·02868             | ·03350          | ·03510          | ·03070                           | ·03183                           | ·03183                           |
| 15   | ·01193             | ·01242          | ·01393          | ·01236                           | 45   | ·03000             | ·03514          | ·03631          | ·03206                           | ·03323                           | ·03323                           |
| 16   | ·01227             | ·01281          | ·01436          | ·01272                           | 46   | ·03143             | ·03674          | ·03779          | ·03353                           | ·03473                           | ·03473                           |
| 17   | ·01258             | ·01319          | ·01479          | ·01307                           | 47   | ·03298             | ·03821          | ·03939          | ·03512                           | ·03631                           | ·03631                           |
| 18   | ·01287             | ·01358          | ·01523          | ·01341                           | 48   | ·03465             | ·04046          | ·04114          | ·03686                           | ·03800                           | ·03800                           |
| 19   | ·01315             | ·01397          | ·01567          | ·01375                           | 49   | ·03645             | ·04254          | ·04303          | ·03869                           | ·03982                           | ·03982                           |
| 20   | ·01343             | ·01438          | ·01613          | ·01408                           | 50   | ·03841             | ·04480          | ·04509          | ·04070                           | ·04181                           | ·04181                           |
| 21   | ·01372             | ·01480          | ·01661          | ·01443                           | 51   | ·04062             | ·04726          | ·04733          | ·04289                           | ·04399                           | ·04399                           |
| 22   | ·01402             | ·01526          | ·01711          | ·01480                           | 52   | ·04288             | ·04995          | ·04977          | ·04527                           | ·04643                           | ·04643                           |
| 23   | ·01434             | ·01573          | ·01763          | ·01522                           | 53   | ·04538             | ·05291          | ·05246          | ·04788                           | ·04913                           | ·04913                           |
| 24   | ·01468             | ·01623          | ·01817          | ·01569                           | 54   | ·04818             | ·05615          | ·05545          | ·05076                           | ·05213                           | ·05213                           |
| 25   | ·01504             | ·01674          | ·01873          | ·01601                           | 55   | ·05128             | ·05971          | ·05881          | ·05396                           | ·05546                           | ·05546                           |
| 26   | ·01543             | ·01728          | ·01920          | ·01646                           | 56   | ·05476             | ·06363          | ·06267          | ·05753                           | ·05917                           | ·05917                           |
| 27   | ·01583             | ·01784          | ·01979          | ·01704                           | 57   | ·05869             | ·06798          | ·06702          | ·06157                           | ·06329                           | ·06329                           |
| 28   | ·01627             | ·01842          | ·02040          | ·01743                           | 58   | ·06318             | ·07287          | ·07208          | ·06616                           | ·06794                           | ·06794                           |
| 29   | ·01673             | ·01902          | ·02103          | ·01795                           | 59   | ·06836             | ·07844          | ·07792          | ·07145                           | ·07323                           | ·07323                           |
| 30   | ·01722             | ·01965          | ·02168          | ·01838                           | 60   | ·07443             | ·08489          | ·08468          | ·07798                           | ·07934                           | ·07934                           |
| 31   | ·01774             | ·02030          | ·02238          | ·01907                           | 61   | ·08164             | ·09253          | ·09260          | ·08499                           | ·08651                           | ·08651                           |
| 32   | ·01830             | ·02099          | ·02311          | ·01968                           | 62   | ·09041             | ·10175          | ·10198          | ·09388                           | ·09507                           | ·09507                           |
| 33   | ·01889             | ·02171          | ·02387          | ·02033                           | 63   | ·10123             | ·11312          | ·11340          | ·10485                           | ·10560                           | ·10560                           |
| 34   | ·01959             | ·02248          | ·02467          | ·02101                           | 64   | ·11496             | ·12635          | ·12773          | ·11876                           | ·11894                           | ·11894                           |
| 35   | ·02019             | ·02328          | ·02549          | ·02173                           | 65   | ·13565             | ·14647          | ·14646          | ·13703                           | ·13653                           | ·13653                           |
| 36   | ·02090             | ·02414          | ·02635          | ·02249                           | 66   | ·15784             | ·17261          | ·17226          | ·16223                           | ·16098                           | ·16098                           |
| 37   | ·02166             | ·02506          | ·02725          | ·02330                           | 67   | ·19453             | ·21180          | ·21047          | ·19949                           | ·19748                           | ·19748                           |
| 38   | ·02246             | ·02604          | ·02820          | ·02417                           | 68   | ·25488             | ·27567          | ·27348          | ·26083                           | ·25794                           | ·25794                           |
| 39   | ·02333             | ·02708          | ·02919          | ·02509                           | 69   | ·37433             | ·40160          | ·39847          | ·38221                           | ·37819                           | ·37819                           |











TABLE A Q.

*Single Premium for Sickness Allowance of £1 per Week to cease at Age 70.—Three per Cent.—Friendly Societies.—Males.*

| Age. | ENGLAND AND WALES. |                 |                 |                                  | Age. | ENGLAND AND WALES. |                 |                 |                                  | Age. | ENGLAND AND WALES. |                 |                 |                                  | SCOTLAND. |  |
|------|--------------------|-----------------|-----------------|----------------------------------|------|--------------------|-----------------|-----------------|----------------------------------|------|--------------------|-----------------|-----------------|----------------------------------|-----------|--|
|      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. |      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. |      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. | SCOTLAND. |  |
| 10   | 30.51966           | 36.22972        | 28.20766        | 31.86825                         | 40   | 46.56296           | 55.56052        | 46.00568        | 48.83092                         | 40   | 46.56296           | 55.56052        | 46.00568        | 48.83092                         | 44.1712   |  |
| 11   | 31.27814           | 36.13063        | 28.81759        | 32.43255                         | 41   | 47.25304           | 56.48385        | 46.55024        | 49.56284                         | 41   | 47.25304           | 56.48385        | 46.55024        | 49.56284                         | 44.9897   |  |
| 12   | 31.86005           | 36.21606        | 29.44849        | 32.91776                         | 42   | 47.94233           | 57.37929        | 47.09078        | 50.28311                         | 42   | 47.94233           | 57.37929        | 47.09078        | 50.28311                         | 45.8073   |  |
| 13   | 32.29090           | 36.45319        | 30.10321        | 33.34342                         | 43   | 48.62687           | 58.23508        | 47.61848        | 50.98924                         | 43   | 48.62687           | 58.23508        | 47.61848        | 50.98924                         | 46.6212   |  |
| 14   | 32.62343           | 36.80865        | 30.78488        | 33.73004                         | 44   | 49.30957           | 59.04067        | 48.12575        | 51.67874                         | 44   | 49.30957           | 59.04067        | 48.12575        | 51.67874                         | 47.4299   |  |
| 15   | 32.90212           | 37.24804        | 31.49726        | 34.09838                         | 45   | 49.99718           | 59.78395        | 48.60345        | 52.34908                         | 45   | 49.99718           | 59.78395        | 48.60345        | 52.34908                         | 48.2316   |  |
| 16   | 33.17729           | 37.73589        | 32.24450        | 34.47050                         | 46   | 50.69131           | 60.45116        | 49.04110        | 52.99728                         | 46   | 50.69131           | 60.45116        | 49.04110        | 52.99728                         | 49.0253   |  |
| 17   | 33.49848           | 38.23622        | 33.03046        | 34.86947                         | 47   | 51.39297           | 61.03194        | 49.42792        | 53.62002                         | 47   | 51.39297           | 61.03194        | 49.42792        | 53.62002                         | 49.8103   |  |
| 18   | 33.86100           | 38.74763        | 33.83867        | 35.29314                         | 48   | 52.09479           | 61.53154        | 49.75235        | 54.21257                         | 48   | 52.09479           | 61.53154        | 49.75235        | 54.21257                         | 50.5632   |  |
| 19   | 34.25860           | 39.27016        | 34.64059        | 35.73895                         | 49   | 52.78710           | 61.95589        | 50.00207        | 54.76878                         | 49   | 52.78710           | 61.95589        | 50.00207        | 54.76878                         | 51.2595   |  |
| 20   | 34.68519           | 39.80233        | 35.41518        | 36.20420                         | 50   | 53.45831           | 62.31153        | 50.16440        | 55.28222                         | 50   | 53.45831           | 62.31153        | 50.16440        | 55.28222                         | 51.8728   |  |
| 21   | 35.13445           | 40.34312        | 36.13620        | 36.68604                         | 51   | 54.09793           | 62.60595        | 50.22514        | 55.74687                         | 51   | 54.09793           | 62.60595        | 50.22514        | 55.74687                         | 52.3762   |  |
| 22   | 35.59858           | 40.89142        | 36.77765        | 37.18099                         | 52   | 54.69490           | 62.84480        | 50.17009        | 56.15597                         | 52   | 54.69490           | 62.84480        | 50.17009        | 56.15597                         | 52.7393   |  |
| 23   | 36.07612           | 41.45520        | 37.35127        | 37.68967                         | 53   | 55.23193           | 63.02802        | 49.97483        | 56.49660                         | 53   | 55.23193           | 63.02802        | 49.97483        | 56.49660                         | 52.9757   |  |
| 24   | 36.56585           | 42.04129        | 37.87207        | 38.21185                         | 54   | 55.60116           | 63.15490        | 49.61452        | 56.75405                         | 54   | 55.60116           | 63.15490        | 49.61452        | 56.75405                         | 53.0986   |  |
| 25   | 37.06553           | 42.65912        | 38.35728        | 38.74841                         | 55   | 55.95894           | 63.22429        | 49.06310        | 56.91284                         | 55   | 55.95894           | 63.22429        | 49.06310        | 56.91284                         | 53.1216   |  |
| 26   | 37.57332           | 43.31879        | 38.91030        | 39.29923                         | 56   | 56.19870           | 63.23545        | 48.29088        | 56.95763                         | 56   | 56.19870           | 63.23545        | 48.29088        | 56.95763                         | 53.0585   |  |
| 27   | 38.08797           | 44.02626        | 39.38292        | 39.86506                         | 57   | 56.29924           | 63.18569        | 47.26842        | 56.86948                         | 57   | 56.29924           | 63.18569        | 47.26842        | 56.86948                         | 52.9246   |  |
| 28   | 38.61335           | 44.77782        | 39.85820        | 40.44812                         | 58   | 56.20182           | 62.99597        | 45.99730        | 56.59299                         | 58   | 56.20182           | 62.99597        | 45.99730        | 56.59299                         | 52.6675   |  |
| 29   | 39.15479           | 45.56794        | 40.33660        | 41.04996                         | 59   | 55.84340           | 62.58375        | 44.47561        | 56.06855                         | 59   | 55.84340           | 62.58375        | 44.47561        | 56.06855                         | 52.2309   |  |
| 30   | 39.71760           | 46.39042        | 40.81807        | 41.67304                         | 60   | 55.15634           | 61.85428        | 42.69764        | 55.23260                         | 60   | 55.15634           | 61.85428        | 42.69764        | 55.23260                         | 51.5541   |  |
| 31   | 40.30747           | 47.23943        | 41.30351        | 42.31917                         | 61   | 54.06849           | 60.71069        | 40.65305        | 54.01532                         | 61   | 54.06849           | 60.71069        | 40.65305        | 54.01532                         | 50.5716   |  |
| 32   | 41.02354           | 48.10816        | 41.80177        | 42.99093                         | 62   | 52.50331           | 59.04517        | 38.32589        | 52.34221                         | 62   | 52.50331           | 59.04517        | 38.32589        | 52.34221                         | 49.2112   |  |
| 33   | 41.67624           | 48.99586        | 42.31243        | 43.68453                         | 63   | 50.30187           | 56.66607        | 35.67345        | 50.05733                         | 63   | 50.30187           | 56.66607        | 35.67345        | 50.05733                         | 47.2933   |  |
| 34   | 42.35024           | 49.90100        | 42.83533        | 44.39604                         | 64   | 47.28872           | 53.36069        | 32.64623        | 46.98774                         | 64   | 47.28872           | 53.36069        | 32.64623        | 46.98774                         | 44.6236   |  |
| 35   | 43.04039           | 50.82250        | 43.37036        | 45.12188                         | 65   | 43.27124           | 48.88897        | 29.18848        | 42.94219                         | 65   | 43.27124           | 48.88897        | 29.18848        | 42.94219                         | 40.9909   |  |
| 36   | 43.74110           | 51.75921        | 43.81632        | 45.85798                         | 66   | 38.02084           | 42.98096        | 25.23498        | 37.70515                         | 66   | 38.02084           | 42.98096        | 25.23498        | 37.70515                         | 36.1634   |  |
| 37   | 44.44605           | 52.70909        | 44.36256        | 46.60005                         | 67   | 31.30418           | 35.26872        | 20.71028        | 31.02805                         | 67   | 31.30418           | 35.26872        | 20.71028        | 31.02805                         | 29.8892   |  |
| 38   | 45.15279           | 53.66490        | 44.91049        | 47.34727                         | 68   | 22.90367           | 25.72042        | 15.26735        | 22.69965                         | 68   | 22.90367           | 25.72042        | 15.26735        | 22.69965                         | 21.9507   |  |
| 39   | 45.85947           | 54.61790        | 45.45883        | 48.09141                         | 69   | 12.56936           | 14.07064        | 8.51399         | 12.46247                         | 69   | 12.56936           | 14.07064        | 8.51399         | 12.46247                         | 12.0902   |  |



TABLE A R.

Temporary Annual Premium for Sickness Allowance of £1 per Week, to continue till Age 70.—Three per Cent.—Friendly Societies.—Males.

| Age. | ENGLAND AND WALES. |                 |                 |                                  | Age. | ENGLAND AND WALES. |                 |                 |                                  | SCOTLAND.                        |                                  |
|------|--------------------|-----------------|-----------------|----------------------------------|------|--------------------|-----------------|-----------------|----------------------------------|----------------------------------|----------------------------------|
|      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. |      | Rural Districts.   | Town Districts. | City Districts. | Rural, Town, and City Districts. | Rural, Town, and City Districts. | Rural, Town, and City Districts. |
| 10   | 1.22262            | 1.45787         | 1.17326         | 1.28519                          | 40   | 2.63176            | 3.31129         | 2.82968         | 2.83154                          | 2.6067                           | 2.6067                           |
| 11   | 1.26436            | 1.46668         | 1.20941         | 1.31959                          | 41   | 2.72540            | 3.43334         | 2.92046         | 2.93421                          | 2.7099                           | 2.7099                           |
| 12   | 1.30006            | 1.48363         | 1.24748         | 1.35209                          | 42   | 2.82697            | 3.56947         | 3.01531         | 3.04228                          | 2.8191                           | 2.8191                           |
| 13   | 1.33034            | 1.50748         | 1.28762         | 1.38295                          | 43   | 2.93374            | 3.71163         | 3.11438         | 3.15611                          | 2.9361                           | 2.9361                           |
| 14   | 1.35701            | 1.53689         | 1.32995         | 1.41275                          | 44   | 3.04755            | 3.85961         | 3.22556         | 3.27618                          | 3.0602                           | 3.0602                           |
| 15   | 1.38152            | 1.57042         | 1.37464         | 1.44215                          | 45   | 3.16953            | 4.02243         | 3.32613         | 3.40302                          | 3.1917                           | 3.1917                           |
| 16   | 1.40564            | 1.60653         | 1.42185         | 1.47173                          | 46   | 3.30065            | 4.17206         | 3.43929         | 3.53729                          | 3.3308                           | 3.3308                           |
| 17   | 1.43115            | 1.64357         | 1.47174         | 1.50228                          | 47   | 3.44201            | 4.31512         | 3.55776         | 3.67973                          | 3.4777                           | 3.4777                           |
| 18   | 1.45809            | 1.68168         | 1.52350         | 1.53391                          | 48   | 3.59420            | 4.50613         | 3.68122         | 3.83358                          | 3.6323                           | 3.6323                           |
| 19   | 1.48653            | 1.72106         | 1.57621         | 1.56677                          | 49   | 3.75768            | 4.68414         | 3.80931         | 3.99137                          | 3.7944                           | 3.7944                           |
| 20   | 1.51649            | 1.76190         | 1.62891         | 1.60100                          | 50   | 3.93305            | 4.87185         | 3.94155         | 4.16193                          | 3.9639                           | 3.9639                           |
| 21   | 1.54804            | 1.80443         | 1.68057         | 1.63679                          | 51   | 4.13052            | 5.07148         | 4.07744         | 4.34353                          | 4.1406                           | 4.1406                           |
| 22   | 1.58126            | 1.84888         | 1.73004         | 1.67434                          | 52   | 4.32589            | 5.28577         | 4.21637         | 4.53732                          | 4.3247                           | 4.3247                           |
| 23   | 1.61618            | 1.89563         | 1.77793         | 1.71375                          | 53   | 4.53847            | 5.51633         | 4.35786         | 4.74421                          | 4.5178                           | 4.5178                           |
| 24   | 1.65281            | 1.94508         | 1.82488         | 1.75911                          | 54   | 4.76228            | 5.76527         | 4.50137         | 4.96553                          | 4.7223                           | 4.7223                           |
| 25   | 1.69122            | 1.99765         | 1.87159         | 1.79849                          | 55   | 5.01042            | 6.03468         | 4.64624         | 5.20282                          | 4.9409                           | 4.9409                           |
| 26   | 1.73142            | 2.05394         | 1.91883         | 1.84409                          | 56   | 5.27780            | 6.47550         | 4.79465         | 5.45813                          | 5.1774                           | 5.1774                           |
| 27   | 1.77349            | 2.11424         | 1.96730         | 1.89640                          | 57   | 5.56707            | 6.64938         | 4.93716         | 5.73443                          | 5.4358                           | 5.4358                           |
| 28   | 1.81774            | 2.17862         | 2.01737         | 1.94254                          | 58   | 5.87791            | 6.99748         | 5.08156         | 6.03090                          | 5.7163                           | 5.7163                           |
| 29   | 1.86458            | 2.24707         | 2.06932         | 1.99586                          | 59   | 6.20990            | 7.37117         | 5.22405         | 6.34725                          | 6.0183                           | 6.0183                           |
| 30   | 1.91441            | 2.31954         | 2.12238         | 2.04753                          | 60   | 6.56278            | 7.76910         | 5.36326         | 6.70497                          | 6.3417                           | 6.3417                           |
| 31   | 1.96769            | 2.39602         | 2.18023         | 2.11212                          | 61   | 6.93643            | 8.18965         | 5.49721         | 7.03903                          | 6.6864                           | 6.6864                           |
| 32   | 2.02491            | 2.47648         | 2.23994         | 2.17569                          | 62   | 7.33090            | 8.63148         | 5.62308         | 7.41322                          | 7.0527                           | 7.0527                           |
| 33   | 2.09096            | 2.56123         | 2.30273         | 2.24309                          | 63   | 7.73224            | 9.07664         | 5.73687         | 7.79264                          | 7.4266                           | 7.4266                           |
| 34   | 2.15625            | 2.65059         | 2.36869         | 2.31439                          | 64   | 8.11913            | 9.49866         | 5.83244         | 8.15635                          | 7.7880                           | 7.7880                           |
| 35   | 2.22543            | 2.74463         | 2.43790         | 2.38971                          | 65   | 8.62563            | 9.85462         | 5.89985         | 8.47051                          | 8.1045                           | 8.1045                           |
| 36   | 2.29847            | 2.84443         | 2.50472         | 2.46917                          | 66   | 8.68322            | 10.06941        | 5.92143         | 8.67569                          | 8.3199                           | 8.3199                           |
| 37   | 2.37536            | 2.95018         | 2.58048         | 2.55287                          | 67   | 8.68152            | 9.99570         | 5.86224         | 8.65501                          | 9.3243                           | 9.3243                           |
| 38   | 2.45635            | 3.06190         | 2.65983         | 2.64116                          | 68   | 8.20579            | 9.36487         | 5.54553         | 8.16599                          | 7.8803                           | 7.8803                           |
| 39   | 2.54171            | 3.17963         | 2.74285         | 2.73393                          | 69   | 6.52591            | 7.37269         | 4.45111         | 6.48469                          | 6.2813                           | 6.2813                           |



TABLE A S.

Single and Annual Premiums for Sick Allowance of £1 per Week.

| Age. | Payments and Benefits to cease at Age 70. |                   |                                                 |                                            | Benefits to continue through Life. |                                   |                 | Age. |
|------|-------------------------------------------|-------------------|-------------------------------------------------|--------------------------------------------|------------------------------------|-----------------------------------|-----------------|------|
|      | Annual Premiums.                          |                   |                                                 |                                            | Payment to cease at 70.            | Payment to continue through Life. |                 |      |
|      | Highland* Society.                        | Ansell's Results. | Rural, Town, and City Districts, East and West. | Rural, Town, and City Districts, Scotland. | Annual Premium.                    | Annual Premium.                   | Single Premium. |      |
| 10   | ..                                        | ..                | 1.2852                                          | 1.1087                                     | 1.82418                            | 1.78382                           | 45.25344        | 10   |
| 11   | ..                                        | ..                | 1.3196                                          | 1.1466                                     | 1.88195                            | 1.83861                           | 46.25386        | 11   |
| 12   | ..                                        | ..                | 1.3521                                          | 1.1864                                     | 1.93829                            | 1.89181                           | 47.18935        | 12   |
| 13   | ..                                        | ..                | 1.3830                                          | 1.2274                                     | 1.99426                            | 1.94444                           | 48.08238        | 13   |
| 14   | ..                                        | ..                | 1.4128                                          | 1.2684                                     | 2.05051                            | 1.99712                           | 48.95686        | 14   |
| 15   | ..                                        | ..                | 1.4422                                          | 1.3084                                     | 2.10776                            | 2.05055                           | 49.83723        | 15   |
| 16   | ..                                        | ..                | 1.4717                                          | 1.3462                                     | 2.16677                            | 2.10543                           | 50.74952        | 16   |
| 17   | ..                                        | ..                | 1.5023                                          | 1.3806                                     | 2.22832                            | 2.16251                           | 51.72150        | 17   |
| 18   | ..                                        | ..                | 1.5339                                          | 1.4124                                     | 2.29264                            | 2.22197                           | 52.75021        | 18   |
| 19   | ..                                        | ..                | 1.5668                                          | 1.4424                                     | 2.35997                            | 2.28403                           | 53.83229        | 19   |
| 20   | ..                                        | ..                | 1.6010                                          | 1.4716                                     | 2.43056                            | 2.34889                           | 54.96356        | 20   |
| 21   | 0.9666                                    | 1.3479            | 1.6368                                          | 1.5011                                     | 2.50474                            | 2.41681                           | 56.13955        | 21   |
| 22   | 0.9917                                    | 1.3760            | 1.6743                                          | 1.5319                                     | 2.58281                            | 2.48806                           | 57.35479        | 22   |
| 23   | 1.0167                                    | 1.4070            | 1.7138                                          | 1.5643                                     | 2.66504                            | 2.56285                           | 58.61161        | 23   |
| 24   | 1.0458                                    | 1.4392            | 1.7591                                          | 1.5985                                     | 2.75802                            | 2.64718                           | 59.91067        | 24   |
| 25   | 1.0708                                    | 1.4731            | 1.7985                                          | 1.6348                                     | 2.84309                            | 2.72383                           | 61.25446        | 25   |
| 26   | 1.1000                                    | 1.5087            | 1.8441                                          | 1.6734                                     | 2.93954                            | 2.81049                           | 62.64415        | 26   |
| 27   | 1.1333                                    | 1.5463            | 1.8964                                          | 1.7147                                     | 3.04843                            | 2.90800                           | 64.08249        | 27   |
| 28   | 1.1667                                    | 1.5859            | 1.9425                                          | 1.7589                                     | 3.14919                            | 2.99758                           | 65.57331        | 28   |
| 29   | 1.2000                                    | 1.6277            | 1.9959                                          | 1.8062                                     | 3.26339                            | 3.09875                           | 67.11975        | 29   |
| 30   | 1.2417                                    | 1.6718            | 2.0475                                          | 1.8552                                     | 3.37675                            | 3.19853                           | 68.72624        | 30   |
| 31   | 1.2750                                    | 1.7184            | 2.1121                                          | 1.9158                                     | 3.51343                            | 3.31850                           | 70.39642        | 31   |
| 32   | 1.3167                                    | 1.7676            | 2.1757                                          | 1.9746                                     | 3.65061                            | 3.43806                           | 72.13488        | 32   |
| 33   | 1.3625                                    | 1.8195            | 2.2431                                          | 2.0375                                     | 3.79663                            | 3.56451                           | 73.94001        | 33   |
| 34   | 1.4125                                    | 1.8743            | 2.3144                                          | 2.1047                                     | 3.95202                            | 3.69817                           | 75.80993        | 34   |
| 35   | 1.4583                                    | 1.9320            | 2.3897                                          | 2.1762                                     | 4.11740                            | 3.83937                           | 77.74365        | 35   |
| 36   | 1.5167                                    | 1.9930            | 2.4692                                          | 2.2523                                     | 4.29348                            | 3.98848                           | 79.73958        | 36   |
| 37   | 1.5750                                    | 2.0574            | 2.5529                                          | 2.3331                                     | 4.47069                            | 4.14592                           | 81.79603        | 37   |
| 38   | 1.6333                                    | 2.1254            | 2.6412                                          | 2.4188                                     | 4.68104                            | 4.31212                           | 83.91558        | 38   |
| 39   | 1.6958                                    | 2.1972            | 2.7339                                          | 2.5099                                     | 4.89432                            | 4.48791                           | 86.09388        | 39   |
| 40   | 1.7667                                    | 2.2731            | 2.8315                                          | 2.6067                                     | 5.12214                            | 4.67342                           | 88.33321        | 40   |
| 41   | 1.8417                                    | 2.3532            | 2.9342                                          | 2.7099                                     | 5.36580                            | 4.86948                           | 90.63574        | 41   |
| 42   | 1.9208                                    | 2.4380            | 3.0423                                          | 2.8191                                     | 5.62690                            | 5.07688                           | 93.00194        | 42   |
| 43   | 2.0042                                    | 2.5277            | 3.1561                                          | 2.9361                                     | 5.90718                            | 5.29642                           | 95.43467        | 43   |
| 44   | 2.0958                                    | 2.6226            | 3.2762                                          | 3.0602                                     | 6.20876                            | 5.52911                           | 97.93764        | 44   |
| 45   | 2.1917                                    | 2.7232            | 3.4030                                          | 3.1917                                     | 6.53410                            | 5.77602                           | 100.51489       | 45   |
| 46   | ..                                        | 2.8300            | 3.5373                                          | 3.3308                                     | 6.88605                            | 6.03842                           | 103.17002       | 46   |
| 47   | ..                                        | 2.9435            | 3.6797                                          | 3.4777                                     | 7.26799                            | 6.31773                           | 105.90721       | 47   |
| 48   | ..                                        | 3.0645            | 3.8336                                          | 3.6323                                     | 7.68896                            | 6.61524                           | 108.73331       | 48   |
| 49   | ..                                        | 3.1938            | 3.9914                                          | 3.7944                                     | 8.13695                            | 6.93230                           | 111.65371       | 49   |
| 50   | ..                                        | 3.3318            | 4.1619                                          | 3.9639                                     | 8.63337                            | 7.27064                           | 114.67544       | 50   |
| 51   | ..                                        | 3.4800            | 4.3435                                          | 4.1406                                     | 9.17901                            | 7.63205                           | 117.80749       | 51   |
| 52   | ..                                        | 3.6393            | 4.5373                                          | 4.3247                                     | 9.78140                            | 8.01875                           | 121.05895       | 52   |
| 53   | ..                                        | 3.8107            | 4.7442                                          | 4.5178                                     | 10.44921                           | 8.43265                           | 124.43467       | 53   |
| 54   | ..                                        | 3.9958            | 4.9655                                          | 4.7223                                     | 11.19351                           | 8.87629                           | 127.93754       | 54   |
| 55   | ..                                        | 4.1963            | 5.2028                                          | 4.9409                                     | 12.02794                           | 9.35235                           | 131.57168       | 55   |
| 56   | ..                                        | 4.4139            | 5.4581                                          | 5.1774                                     | 12.96967                           | 9.86389                           | 135.34342       | 56   |
| 57   | ..                                        | 4.6505            | 5.7344                                          | 5.4358                                     | 14.04234                           | 10.41527                          | 139.26056       | 57   |
| 58   | ..                                        | 4.9085            | 6.0309                                          | 5.7163                                     | 15.27047                           | 11.00733                          | 143.29562       | 58   |
| 59   | ..                                        | 5.1903            | 6.3473                                          | 6.0183                                     | 16.68888                           | 11.64210                          | 147.42162       | 59   |
| 60   | ..                                        | 5.4990            | 6.7050                                          | 6.3417                                     | 18.40498                           | 12.34866                          | 151.61214       | 60   |
| 61   | ..                                        | ..                | 7.0390                                          | 6.6864                                     | 20.30792                           | 13.04968                          | 155.83668       | 61   |
| 62   | ..                                        | ..                | 7.4132                                          | 7.0527                                     | 22.67034                           | 13.82718                          | 160.06755       | 62   |
| 63   | ..                                        | ..                | 7.7926                                          | 7.4266                                     | 25.56717                           | 14.65102                          | 164.23507       | 63   |
| 64   | ..                                        | ..                | 8.1564                                          | 7.7880                                     | 29.20809                           | 15.51609                          | 168.26433       | 64   |
| 65   | ..                                        | ..                | 8.4705                                          | 8.1045                                     | 33.94406                           | 16.41560                          | 172.08306       | 65   |
| 66   | ..                                        | ..                | 8.6757                                          | 8.3199                                     | 40.40871                           | 17.34150                          | 175.61910       | 66   |
| 67   | ..                                        | ..                | 8.6550                                          | 9.3243                                     | 49.87166                           | 18.28333                          | 178.78889       | 67   |
| 68   | ..                                        | ..                | 8.1660                                          | 7.8803                                     | 65.32729                           | 19.23611                          | 181.59549       | 68   |
| 69   | ..                                        | ..                | 8.4847                                          | 6.2813                                     | 95.76302                           | 20.19314                          | 184.04026       | 69   |

\* This column presumes on money bearing interest at 4 per cent. per annum, and consists of the reciprocals of the quantities given at page 236 of the Highland Society's Report. The other columns are calculated at 3 per cent., as explained in the text.



TABLE A. I.

England and Wales.—Whole Population.—Three per Cent.—Males and Females.

| Age. | Value of Annuities of £L. |          | Single Premium for £1 at Death. |          | Annual Premium for £1 at Death. |          | Age. | Value of Annuities of £L. |          | Single Premium for £1 at Death. |          | Annual Premium for £1 at Death. |          |
|------|---------------------------|----------|---------------------------------|----------|---------------------------------|----------|------|---------------------------|----------|---------------------------------|----------|---------------------------------|----------|
|      | Males.                    | Females. | Males.                          | Females. | Males.                          | Females. |      | Males.                    | Females. | Males.                          | Females. | Males.                          | Females. |
| 10   | 23.11227                  | 23.14338 | 29770                           | 29679    | 0.1235                          | 0.1229   | 58   | 11.38827                  | 11.98749 | 63918                           | 62172    | 0.5160                          | 0.4787   |
| 11   | 22.99545                  | 23.02800 | 30110                           | 30015    | 0.1255                          | 0.1249   | 59   | 11.03421                  | 11.62663 | 64949                           | 63224    | 0.5397                          | 0.5007   |
| 12   | 22.85265                  | 22.89028 | 30526                           | 30417    | 0.1280                          | 0.1273   | 60   | 10.67861                  | 11.26347 | 65985                           | 64281    | 0.5650                          | 0.5242   |
| 13   | 22.68828                  | 22.73433 | 31005                           | 30871    | 0.1309                          | 0.1301   | 61   | 10.32147                  | 10.89617 | 67025                           | 65351    | 0.5920                          | 0.5493   |
| 14   | 22.50725                  | 22.56764 | 31532                           | 31357    | 0.1341                          | 0.1331   | 62   | 9.96440                   | 10.52557 | 68065                           | 66430    | 0.6208                          | 0.5764   |
| 15   | 22.31543                  | 22.38900 | 32091                           | 31877    | 0.1376                          | 0.1363   | 63   | 9.60720                   | 10.15327 | 69105                           | 67515    | 0.6515                          | 0.6053   |
| 16   | 22.11918                  | 22.21132 | 32663                           | 32394    | 0.1413                          | 0.1396   | 64   | 9.25149                   | 9.78209  | 70141                           | 68596    | 0.6842                          | 0.6362   |
| 17   | 21.92528                  | 22.03870 | 33227                           | 32897    | 0.1449                          | 0.1428   | 65   | 8.89699                   | 9.41209  | 71174                           | 69673    | 0.7192                          | 0.6692   |
| 18   | 21.73428                  | 21.87023 | 33784                           | 33388    | 0.1486                          | 0.1460   | 66   | 8.54558                   | 9.04511  | 72197                           | 70742    | 0.7563                          | 0.7043   |
| 19   | 21.54610                  | 21.70490 | 34332                           | 33869    | 0.1533                          | 0.1492   | 67   | 8.19602                   | 8.68050  | 73216                           | 71804    | 0.7962                          | 0.7417   |
| 20   | 21.36038                  | 21.54070 | 34873                           | 34347    | 0.1560                          | 0.1524   | 68   | 7.84976                   | 8.31957  | 74224                           | 72855    | 0.8387                          | 0.7817   |
| 21   | 21.17461                  | 21.37586 | 35414                           | 34828    | 0.1597                          | 0.1557   | 69   | 7.50606                   | 7.96177  | 75225                           | 73898    | 0.8844                          | 0.8246   |
| 22   | 20.98913                  | 21.20815 | 35954                           | 35316    | 0.1635                          | 0.1590   | 70   | 7.16642                   | 7.60903  | 76214                           | 74925    | 0.9333                          | 0.8703   |
| 23   | 20.80300                  | 21.03800 | 36496                           | 35812    | 0.1674                          | 0.1625   | 71   | 6.83048                   | 7.26065  | 77193                           | 75940    | 0.9858                          | 0.9193   |
| 24   | 20.61646                  | 20.86560 | 37039                           | 36314    | 0.1714                          | 0.1661   | 72   | 6.50013                   | 6.91893  | 78155                           | 76935    | 1.0421                          | 0.9715   |
| 25   | 20.42957                  | 20.69063 | 37584                           | 36824    | 0.1754                          | 0.1698   | 73   | 6.17497                   | 6.58320  | 79102                           | 77913    | 1.1025                          | 1.0274   |
| 26   | 20.24140                  | 20.51300 | 38132                           | 37341    | 0.1795                          | 0.1736   | 74   | 5.85700                   | 6.25542  | 80028                           | 78868    | 1.1671                          | 1.0870   |
| 27   | 20.05073                  | 20.33263 | 38687                           | 37866    | 0.1838                          | 0.1775   | 75   | 5.54513                   | 5.93475  | 80937                           | 79802    | 1.2366                          | 1.1507   |
| 28   | 19.85678                  | 20.14938 | 39252                           | 38400    | 0.1882                          | 0.1816   | 76   | 5.24219                   | 5.62337  | 81819                           | 80709    | 1.313                           | 1.2185   |
| 29   | 19.65875                  | 19.96300 | 39829                           | 38943    | 0.1928                          | 0.1858   | 77   | 4.94773                   | 5.32100  | 82677                           | 81589    | 1.3901                          | 1.2908   |
| 30   | 19.45529                  | 19.77275 | 40421                           | 39497    | 0.1976                          | 0.1901   | 78   | 4.66492                   | 5.02946  | 83500                           | 82438    | 1.4740                          | 1.3673   |
| 31   | 19.24592                  | 19.57900 | 41031                           | 40061    | 0.2027                          | 0.1947   | 79   | 4.39401                   | 4.74776  | 84289                           | 83259    | 1.5627                          | 1.4485   |
| 32   | 19.03114                  | 19.38100 | 41657                           | 40638    | 0.2080                          | 0.1994   | 80   | 4.13709                   | 4.47790  | 85037                           | 84045    | 1.6554                          | 1.5343   |
| 33   | 18.80978                  | 19.17900 | 42302                           | 41226    | 0.2135                          | 0.2043   | 81   | 3.89182                   | 4.21856  | 85752                           | 84800    | 1.7530                          | 1.6250   |
| 34   | 18.58228                  | 18.97000 | 42964                           | 41835    | 0.2194                          | 0.2095   | 82   | 3.65952                   | 3.97062  | 86429                           | 85523    | 1.8549                          | 1.7206   |
| 35   | 18.34839                  | 18.76000 | 43645                           | 42446    | 0.2256                          | 0.2148   | 83   | 3.44548                   | 3.73255  | 87052                           | 86216    | 1.9582                          | 1.8218   |
| 36   | 18.10807                  | 18.54214 | 44345                           | 43081    | 0.2321                          | 0.2205   | 84   | 3.22525                   | 3.50576  | 87693                           | 86877    | 2.0754                          | 1.9282   |
| 37   | 17.86131                  | 18.31820 | 45064                           | 43733    | 0.2389                          | 0.2264   | 85   | 3.02174                   | 3.28766  | 88286                           | 87512    | 2.1953                          | 2.0410   |
| 38   | 17.60807                  | 18.08791 | 45802                           | 44404    | 0.2461                          | 0.2326   | 86   | 2.82919                   | 3.08074  | 88847                           | 88114    | 2.3203                          | 2.1593   |
| 39   | 17.34854                  | 17.85051 | 46558                           | 45096    | 0.2537                          | 0.2392   | 87   | 2.64670                   | 2.88456  | 89379                           | 88686    | 2.4510                          | 2.2833   |
| 40   | 17.08318                  | 17.60569 | 47331                           | 45809    | 0.2617                          | 0.2462   | 88   | 2.48467                   | 2.70072  | 89850                           | 89221    | 2.5784                          | 2.4110   |
| 41   | 16.81151                  | 17.35314 | 48122                           | 46544    | 0.2702                          | 0.2536   | 89   | 2.32768                   | 2.52868  | 90308                           | 89722    | 2.7138                          | 2.5427   |
| 42   | 16.53416                  | 17.09300 | 48930                           | 47302    | 0.2791                          | 0.2614   | 90   | 2.18378                   | 2.37019  | 90727                           | 90184    | 2.8497                          | 2.6759   |
| 43   | 16.25092                  | 16.82518 | 49755                           | 48082    | 0.2884                          | 0.2695   | 91   | 2.05148                   | 2.22344  | 91112                           | 90611    | 2.9858                          | 2.8110   |
| 44   | 15.96232                  | 16.54983 | 50595                           | 48884    | 0.2983                          | 0.2785   | 92   | 1.93051                   | 2.08767  | 91465                           | 91007    | 3.1212                          | 2.9474   |
| 45   | 15.66814                  | 16.26662 | 51452                           | 49709    | 0.3087                          | 0.2879   | 93   | 1.82362                   | 1.96234  | 91776                           | 91372    | 3.2503                          | 3.0845   |
| 46   | 15.36847                  | 15.97685 | 52325                           | 50553    | 0.3197                          | 0.2978   | 94   | 1.72831                   | 1.84522  | 92053                           | 91713    | 3.3740                          | 3.2234   |
| 47   | 15.06305                  | 15.67908 | 53214                           | 51420    | 0.3313                          | 0.3083   | 95   | 1.64619                   | 1.73887  | 92293                           | 92023    | 3.4878                          | 3.3599   |
| 48   | 14.75208                  | 15.37431 | 54120                           | 52308    | 0.3436                          | 0.3195   | 96   | 1.57820                   | 1.63942  | 92491                           | 92312    | 3.5874                          | 3.4975   |
| 49   | 14.43551                  | 15.06224 | 55042                           | 53217    | 0.3566                          | 0.3313   | 97   | 1.52480                   | 1.54631  | 92646                           | 92584    | 3.6694                          | 3.6360   |
| 50   | 14.11352                  | 14.74322 | 55980                           | 54146    | 0.3704                          | 0.3439   | 98   | 1.48815                   | 1.46233  | 92753                           | 92828    | 3.7277                          | 3.7700   |
| 51   | 13.78608                  | 14.41713 | 56934                           | 55096    | 0.3851                          | 0.3574   | 99   | 1.43605                   | 1.38359  | 92905                           | 93057    | 3.8137                          | 3.9040   |
| 52   | 13.45425                  | 14.08456 | 57900                           | 56064    | 0.4006                          | 0.3717   | 100  | 1.36660                   | 1.29352  | 93107                           | 93320    | 3.9342                          | 4.0689   |
| 53   | 13.11804                  | 13.74564 | 58880                           | 57052    | 0.4171                          | 0.3869   | 101  | 1.34601                   | 1.18638  | 93167                           | 93632    | 3.9713                          | 4.2825   |
| 54   | 12.77812                  | 13.40139 | 59870                           | 58054    | 0.4345                          | 0.4031   | 102  | 1.23955                   | 1.07204  | 93477                           | 93965    | 4.1738                          | 4.5350   |
| 55   | 12.43500                  | 13.05178 | 60869                           | 59072    | 0.4531                          | 0.4204   | 103  | 1.07469                   | 0.95359  | 93999                           | 94310    | 4.5307                          | 4.8275   |
| 56   | 12.08888                  | 12.69900 | 61877                           | 60100    | 0.4727                          | 0.4387   | 104  | 0.77105                   | 0.82410  | 94841                           | 94687    | 5.3549                          | 5.1909   |
| 57   | 11.73952                  | 12.34450 | 62895                           | 61133    | 0.4937                          | 0.4581   | 105  | 0.32363                   | 0.48544  | 96145                           | 95674    | 7.2639                          | 6.4410   |



Annuities, although not in so marked a degree, nor to the same extent as in the simple Mortality Tables. If money made no interest, it is plain that the value of Annuities, and the numerical expression in the Expectation Tables or Mortality Tables of Collective Intensity, would be identical, and under that aspect Annuities would have a maximum value. Again, if money could realise an infinite amount of interest, Annuities would then be at a minimum value, and have the same expression for every Table of Mortality and every age in those Tables. To illustrate this, suppose money could realise 100 per cent., or always double or replace itself in the course of a year; and starting with unity, before the expiration of the first term of the annuity a new fund would have formed itself capable of meeting the annuity, and leaving exactly the original unit with which the start was made, ready to enter on the second term of the annuity in the same manner, and so on *ad infinitum*. Under such an aspect, no matter what Table of Mortality was employed, the values of annuities would differ but little, as unity would invariably be capable, from the interest realised only, of meeting every payment for an absolute term of years. It is therefore evident that the values of annuities involving the discount of money will always shew less distinction between different Tables of Mortality than the Tables themselves will shew; and that the higher the rate of interest, the less distinction is observable between the annuities of different Tables, as well as less difference between the values of annuities at various ages for the same Mortality Table.

On reference to page 37, it will be seen that the difference of Expectation between the Rural and City Districts at age 30 is 14.442 per cent.; but a comparison of the values of Annuities at that age for the same Districts, as given at page 470, will shew a difference of only 9.729 per cent. The following Abstract will give a concise view of the relative values of the two expressions:—

| Age. | Expectation of Life in |                 | Excess<br>per cent.<br>in favour of<br>Rural Districts. | Value of Annuities<br>Three per Cent. |                 | Excess<br>per cent.<br>in favour of<br>Rural Districts. |
|------|------------------------|-----------------|---------------------------------------------------------|---------------------------------------|-----------------|---------------------------------------------------------|
|      | Rural Districts.       | City Districts. |                                                         | Rural Districts.                      | City Districts. |                                                         |
| 20   | 45.3550                | 40.0148         | 11.774                                                  | 22.78605                              | 21.29054        | 6.563                                                   |
| 40   | 30.9724                | 26.0873         | 15.772                                                  | 18.60452                              | 16.45861        | 11.534                                                  |
| 60   | 16.6524                | 13.7685         | 17.318                                                  | 11.85797                              | 10.18722        | 14.090                                                  |

Again, for reasons precisely similar, less distinction will be found to exist between the values of Annuities for various ages in the same Table, than between the Expectations of Life for those ages; for example, the difference of Expectation between ages 30 and 60 in the Rural Districts is 21.7549 years, or nearly 57 per cent.; but the difference between the values of Annuities for those ages in the Rural Districts is 9.2097, or about 44 per cent. Like results will also be found for other ages, no matter what Table of Mortality



be employed: taking the general results for the Three Districts for ages 50 and 70, the difference of Expectation will be found to be 11.9863 years, or about 54 per cent.; but the difference in the values of the Annuities for those ages is 7.1460, or 46 per cent. The difference in this instance is however less than in the former, on account of more proximate and more advanced ages being taken; but with ages less proximate and less advanced, the difference will exceed that in either of the preceding cases. Let ages 10 and 50 in the Rural Districts be compared, and the difference of Expectation will be found to be 56 per cent., but the difference in the value of Annuities is only 37 per cent.

From these remarks respecting the relative values of Annuities, and the Expectation of Life in various Mortality Tables, it is not to be considered that practically it is a matter of indifference which Table may be used as a basis for calculations for the guidance of a Society. The objects of these remarks is intended to lead to quite the opposite conclusion, and to prevent those who are not thoroughly conversant with such subjects from hastily adopting any given Table, simply because the money test, by which it is generally brought into comparison with other Tables, shews but little difference. The success of every friendly society, and other Institution dealing in Life Contingencies, depends in a great measure on the proper investment of its funds; and although Annuities by two different Mortality Tables may apparently approximate to nearly equivalent values, still, before all the conditions of each Table are practically determined, the accumulation of interest as presumed on in the construction of the Tables, will ultimately realise the maximum difference which is found to prevail between the Expectation of Life for the respective Tables.

The following are the values of Annuities at 3 per cent. as given at page 470, and also according to the Carlisle Table, Mr. Ansell's Table, and the Northampton Table.

| Age. | ENGLAND AND WALES.  |                    |                    |                                   | SCOTLAND.                         | Carlisle. | Ansell. | North-<br>ampton. | Age. |
|------|---------------------|--------------------|--------------------|-----------------------------------|-----------------------------------|-----------|---------|-------------------|------|
|      | Rural<br>Districts. | Town<br>Districts. | City<br>Districts. | Rural, Town, &<br>City Districts. | Rural, Town, &<br>City Districts. |           |         |                   |      |
| 20   | 22.78605            | 22.18086           | 21.29054           | 22.39981                          | 22.04167                          | 21.694    | 20.4602 | 18.6385           | 20   |
| 40   | 18.60452            | 17.01150           | 16.45861           | 17.90117                          | 17.56000                          | 17.143    | 15.6673 | 14.8476           | 40   |
| 60   | 11.85797            | 10.12786           | 10.18722           | 11.27757                          | 11.18877                          | 10.391    | 9.8583  | 9.7774            | 60   |

To those desirous of inquiring minutely into the relative values of Annuities for the different Tables given in this paper, and the Tables of Mortality hitherto in use, a careful consideration of their respective bearings will be important; for as Annuity Tables are the foundation on which all the subsequent Monetary Tables are built, their peculiarities must affect the whole structure. This will be clearly seen on inspection of the Table



for Deferred Annuities at page 471. According to that Table, at age 30 the value of a Deferred Annuity of £1 per annum, to commence forty years hence or on attaining age 70, is, for the Rural, Town, and City Districts, 1.13398, and the value of the same sum according to Mr. Ansell's Table is only .6764. This is a most remarkable distinction, and of vital importance to friendly societies; for although the present results for age 30 shew an excess of value in simple or Immediate Annuities of less than 13 per cent. above those given by Mr. Ansell, yet in the Deferred Annuity at the same age there is an excess of 69 per cent. It is under such circumstances as these, where the improvement of money at interest magnifies results, that serious blunders in the adoption of an erroneous Mortality Table will be apt to prove hurtful to the interests of a Society.

Few friendly societies granting Deferred Annuities have yet survived long enough to suffer from the effects of so serious an error; but the above illustration points out the inevitable ruin which must overtake those societies at present granting Deferred Annuities; as very few of them exact terms even so favourable as are required by Mr. Ansell's Tables. A further illustration of this question, and of the manner in which the peculiar result is produced, may be obtained by reference to Table F, page 32. It will be seen, that of 89,360 persons living aged 30, 42,367 attained their 70th year of age; that is to say, out of 100 entering a friendly society at 30 years of age, and purchasing Deferred Annuities, 47 would be alive at 70 years of age, to be placed on the Annuity List; but Mr. Ansell's Table would provide for only 33 of the 47 persons becoming Annuitants. Or more correctly, out of every 1000 members entering those societies at age 30, there would be 147 Annuitants unprovided for; that is to say, 45 per cent. more Annuitants would have claims, than would be calculated on by Mr. Ansell's data, who would therefore be left destitute of any provision for old age.

The melancholy spectacle which such a state of things would produce can be readily imagined. Supposing that at the present time there are only one million members of friendly societies, (which is much under the correct estimate,) whose average age is about 30, and presuming that the terms for Deferred Annuities are graduated according to the preceding hypothesis, 470,000 of those persons would attain the age of 70, and nearly one-third would be without any provision for old age. This is only one of the many evils connected with the present condition of friendly societies; and although its visitation be more remote, the awful consequences of such a calamity, like every other evil of procrastination, will be irreparable.

At page 472 will be found the value of Temporary Annuities to continue till age 70; and from what has been said respecting Immediate Annuities absolute for Life, and Deferred Annuities, it must be evident that Temporary Annuities will also partake of the same relative character as the other Annuity Tables referred to.

Since it has been shewn that, according to the results of this inquiry, Annuities are of greater value than that which is given in many other Tables, it must follow that the



value of Assurances, or sums payable at death, are of less value. An inspection of the Table at page 473 will shew that at age 30 the value of £100 payable at death is £35 14s. 6d. in the Rural Districts, £39 5s. 11d. in the Town Districts, £41 13s. 9d. in the City Districts, £37 8s. 4d. in the Three Districts combined, and £38 13s. 6d. according to the value of Life in Scotland; while, according to the Carlisle Table of Mortality, the value of the same sum would be £40 2s. 7d., by Mr. Ansell's Table £44 2s. 7d., and by the old Northampton Table as much as £47 16s.

Again: the annual premium at age 30 for an Assurance of £100 at death will, according to the Table at page 474, be £1 12s. 5d. for the Rural Districts, £1 17s. 9d. for the Town Districts, £2 1s. 8d. for the City Districts, £1 14s. 1d. for the Three Districts combined, and £1 16s. 9d. for Scotland; but the annual premium according to the Carlisle Table is £1 19s., by Mr. Ansell's Table £2 17s. 1d., and by the Northampton Table £2 13s. 4d. Nothing beyond the most general view of the various Tables is proposed to be here taken, as the remarks formerly made respecting the Tables of Mortality themselves will point out the various modifications which the results must undergo in their application to monetary purposes.

At page 475 will be found the Temporary Annual Premiums payable until age 70, to assure a sum payable at death, whenever that may happen, for each of the Districts. And at pages 476 and 477 will be found the probabilities of living for one year and of dying in one year for each District. As these form elements in the calculations of the rates or premiums for Allowances during Sickness, they are inserted simply as a check upon the calculations.

The next Table to be brought under notice is that at page 478, which represents the single premium necessary to provide an allowance of £1 per week during sickness or incapacity for labour up to the age of 70. All the Tables here given are meant to be illustrative of the true bearings and risks of friendly societies; and the age of 70 has been fixed on in the present instance, and in the other Tables of Temporary Premiums, because it is an age usually adopted in calculations for friendly societies, and will therefore admit of easy comparison with other results on the same subject.

As no attempt has been made in this paper to enter into the general principles of Vital Statistics, or to discuss the methods and formulæ most applicable to questions of Life Contingency, those desiring information on such points had better consult the standard works on the subject; but as the calculations in reference to the benefits offered by friendly societies are limited to the term of 70 years of age, and as it will be necessary in practice to have Tables for other terms of life, Tables in a different, and for many purposes a more convenient, form will be found in a subsequent page. However, it may be desirable for reference to give the formulæ by which the results at page 478 were obtained.



Let  $s$  = the average amount of sickness to each individual for the year immediately following any given age, as given in Table V ;

$v^{\frac{1}{2}}$  = the present value of £1 due six months hence ; and

Let  $s \times v^{\frac{1}{2}} = x$  ; also let

$p$  = the probability of a life of the given age living one year ; and

$v$  = the present value of £1 due one year hence ; and

Let  $p \times v = y$  ; then if

$z$  is made to represent the present value of £1 per week during sickness, from any given age up to an older age—say 70, the successive values for the  $z$  representing each age are found under the following expression:—

$$\lambda z_n = (\lambda z_{n-1} + \lambda y_n) + \lambda x_n$$

And if  $\theta$  is made to represent the terms at the respective ages in page 472,

$\lambda z_n - \lambda (1 + \theta)$  will give the logarithm of the annual premium for an allowance of £1 per week during sickness or incapacity for labour, as set forth in the Table at page 479. In that Table both the annual premium and the benefits are understood to cease on attaining 70 years of age, or sooner in the event of death.

The Tables referred to are calculated on the supposition that the various payments are to be made annually ; but it is well known that friendly societies rarely make any payments at so remote periods. For strictly practical purposes, Tables involving the consideration of annuities payable in monthly or weekly instalments would be better fitted ; but as the object of this paper is to furnish data illustrative of the condition of those societies, and of the nature and extent of the risks undertaken by them, as well as to give practical details for their guidance, further Tables have been inserted.

It is obvious from the remarks already made in regard to Table V, that the premium for an allowance in sickness, according to the results of this inquiry, must be higher than those of former Tables. As Mr. Ansell's information on this subject is the most deserving of attention, any comparison will be limited to the values given at pages 133 and 134 in his interesting treatise. At age 30 the value of £1 per week during sickness, up to attaining age 70, is £30.0958 ; but according to the results at page 478, it is £39.7176 for the Rural Districts ; £46.3904 for the Town Districts ; £40.8181 for the City Districts ; £41.6730 for the Rural, Town, and City Districts combined ; and £37.0322 for Scotland. These, although shewing a very great difference from the values given by Mr. Ansell, are still not greater than might be expected after a careful consideration of Table V, and the remarks made in the preceding pages on that Table. It has been stated that the values of annuities calculated from different mortality Tables will always shew less difference than the mortality Tables themselves ; but the same feature does not present itself in connection with sickness Tables. Two different Tables on the plan



of Table V might indicate precisely the same ratio of sickness at each age, and yet the value of a sick allowance calculated for the one Table might differ widely from that for the other.

In the annuity Tables two elements only affected the results—the rate of mortality and the rate of interest; but three elements affect the sickness Tables—the rate of mortality, the rate of interest, and the rate of sickness. It has been shewn that the rate of mortality does not necessarily increase with an increase in the rate of sickness; and therefore two classes of the population may be influenced by the same or nearly the same degree of sickness, and yet be subject to very different rates of mortality. Keeping this in view—suppose there are two sickness Tables, A and B, having the same or nearly the same rate of sickness at each age; but that the population of Table A is subject to a high rate of mortality compared to Table B,—it is evident, that although each individual of the same age in both Tables would in the course of the same year of life experience the same degree of sickness, yet each person under Table B would be subject to a greater amount of sickness over the whole duration of his life, and for the simple reason, that his expectation of life is greater. Take any number of persons—say 100, on the former Table at 30 years of age, and suppose their expectation, or for greater exactitude, their equation of life, to be 30 years; one-half only of those lives would live to attain 60 years of age; but if on the other Table the equation of life were 40 years, one-half of the same number would not be dead till 70 years of age, a considerable portion of which would be subject to an increased ratio of sickness in the decennial period following age 60. It happens that there is an actual case in point to illustrate this hypothesis. The Rural Districts of England and Wales, and the average results for all Scotland, shew almost exactly the same amount of sickness in the aggregate over the whole period of forty years from age 30 to 70, differing by less than two-tenths of a weeks' sickness; the amount in the

|                                                      |                |
|------------------------------------------------------|----------------|
| Rural Districts of England and Wales being . . . . . | 121·1448 weeks |
| And in the whole of Scotland . . . . .               | 121·3164 ...   |

But the equation of life for the former at age 30 will be found at page 100 to be 40·813 years, while for the latter it is only 37·478 years, being a difference of 3·335 years. And therefore, although there is no greater amount of sickness in the Rural Districts of England and Wales than in Scotland generally, still the value of a sick allowance in the former is greater than in the latter. At page 478 it will be found that at age 30, the single premium for a sickness allowance of £1 per week, to cease at age 70, is in the

|                                                |                   |
|------------------------------------------------|-------------------|
| Rural Districts of England and Wales . . . . . | £39·7176; but for |
| The whole of Scotland only . . . . .           | £37·0322          |

It is therefore evident that the rate of sickness is not of itself a sufficient index to the rates



of premium that may be deduced therefrom. At page 415 it was shewn that the excess of sickness in the present results above those quoted by Mr. Ansell was 21 per cent., but the values for sick allowance, quoted in the preceding page, shew a difference of above 31 per cent. The feature, therefore, which was characteristic of annuity Tables—of approximating nearer to equivalent values than the mortality Tables from which they were deduced—does obviously not distinguish sick allowance Tables.

There is another feature connected with Tables of the rates of sickness, which will affect their money-values, independently of the influence of the rates of mortality, and that is the graduation or distribution of sickness over the various periods of life. It might happen that two sickness Tables gave the same amount of sickness within a given period of years, but that in the one Table it was more uniformly spread over the various terms of life; not shewing, as in the other Table, a very low rate of sickness at the younger ages, and a very high rate at advanced ages. This circumstance, although the rate of mortality in both Tables were the same, would occasion a difference in the value of sick allowances—and for two reasons; first, because the bulk of the sickness in the one Table was deferred till the advanced ages, those persons dying before reaching those ages would experience a minimum amount; and second, because the money liabilities also being deferred, the early premiums would by longer investment accumulate to a greater sum. An inspection of the second Abstract, given on page 413 and the Table on page 415, will shew that such a relation exists between Mr. Ansell's Table and the general results of this inquiry; the sickness in his Table being more uniform, and shewing less disparity for the various ages, while the Highland Society Table runs almost parallel over the whole term of life, from 20 to 70 years of age, with the results for the three Districts.

The following Abstract will shew the comparative values of an allowance of £1 per week in sickness up till age 70:—

| Age. | Mr. Ansell's Table. | ENGLAND AND WALES. |                 |                 |                           | SCOTLAND.                 | Age. |
|------|---------------------|--------------------|-----------------|-----------------|---------------------------|---------------------------|------|
|      |                     | Rural Districts.   | Town Districts. | City Districts. | Three Districts combined. | Three Districts combined. |      |
| 20   | 27·0881             | 34·68519           | 39·80233        | 35·41518        | 36·20420                  | 32·7979                   | 20   |
| 30   | 30·0958             | 39·71760           | 46·39042        | 40·81807        | 41·67304                  | 37·0322                   | 30   |
| 40   | 34·3204             | 46·56296           | 55·56052        | 46·00568        | 48·83092                  | 44·1712                   | 40   |
| 50   | 38·7078             | 53·45831           | 62·31153        | 50·16440        | 55·28222                  | 51·8728                   | 50   |
| 60   | 39·2316             | 55·15634           | 61·85428        | 42·69764        | 55·23260                  | 51·5541                   | 60   |

The important effect of the above differences on the stability and permanence of a society is obvious. The distinction which has been observed in respect of single payments or premiums, will also be found to prevail in the annual premiums, as given at page 479: and the following Abstract will give a general idea of the merits of the various Tables.



The annual premium, as well as the sick allowance, will in this case also terminate on attaining 70 years of age.

| Age. | Mr. Ansell's Table. | ENGLAND AND WALES. |                 |                 |                           | SCOTLAND.                 | Age. |
|------|---------------------|--------------------|-----------------|-----------------|---------------------------|---------------------------|------|
|      |                     | Rural Districts.   | Town Districts. | City Districts. | Three Districts combined. | Three Districts combined. |      |
| 20   | 1.3206              | 1.51649            | 1.76190         | 1.62891         | 1.60100                   | 1.4716                    | 20   |
| 30   | 1.6718              | 1.91441            | 2.31954         | 2.12238         | 2.04753                   | 1.8552                    | 30   |
| 40   | 2.2731              | 2.63176            | 3.31129         | 2.82968         | 2.83154                   | 2.6067                    | 40   |
| 50   | 3.3318              | 3.93305            | 4.87185         | 3.94155         | 4.16193                   | 3.9639                    | 50   |
| 60   | 5.4990              | 6.56278            | 7.76910         | 5.36326         | 6.70497                   | 6.3417                    | 60   |

The preceding observations will be sufficient to point out the leading features of the sickness Tables, and to suggest the proper modes of application to the practical uses of friendly societies. It is not expected that the present paper will obtain anything like a general circulation among the members of those societies, or a different style and mode of treating the subject would have been adopted. All that has been contemplated is such an exhibition of the facts and data as will afford a means of determining the various contingent risks on which the liabilities of friendly societies depend in such a manner as to be intelligible to those taking an interest in vital statistics; but as, in addition to the prizes given, as mentioned at page 17, a further inducement was held out to parties furnishing data, by a promise to publish the results, and present copies to every contributor of data; the following remarks were added bearing on the present condition of friendly societies.

One of the difficulties in the way of obtaining information was the fear, on the part of the members, that its publication might prove hurtful to particular societies; and it was therefore necessary to promise, that whatever use was made of the information, no individual society should be referred to. But that a general idea may be formed of the condition of friendly societies, in respect to the adequacy of their contributions for the benefits held out by them, fifty societies have been selected at random; and in order to make the illustration more simple, one period of life only, age 35, has been fixed on, and the rates in each of the fifty societies in question examined and graduated to represent an allowance of £1 per week during sickness, up to age 70—an annuity of £13 per annum for life after 70—and a sum of £10 payable at death, whenever that may happen. The corresponding rates having been determined in each society for the above scale, they were found to average only £1 11s. 5d.; but in many of the societies an entry money is paid, and for the same age it was found to average £1 1s. 9d. As the value of the temporary annuity at the same time of life is 17.88172, the above entry money will be equivalent to an annual contribution of about 1s. 3d., which, added to the other item, will render the



whole annual contribution £1 12s. 8d. The entire inadequacy of such a contribution to provide for the benefits offered must be apparent. Page 479 will shew, that for the single benefit of £1 weekly, during sickness, the annual contribution should be £2 7s. 9½d.; and on examination of the respective Tables it will be seen that the contribution adequate to provide for the three benefits offered is £3 7s. annually, or more than double the actual amount collected. This is a most lamentable condition in which to find societies aiming at designs so benevolent and praiseworthy. It may seem strange that they should endure for even a year or two; but if the amount of sickness at page 415 be examined, and the young period of life at which members generally enter be borne in mind, it will appear that they may survive at least 25 or 30 years before their insecurity becomes evident to an ordinary observer. Members are generally satisfied, in the first periods of a society, to find that the income has exceeded the expenditure and left a respectable balance, losing sight of the great accumulations which are necessary to meet the future liabilities incidental to their increasing years and infirmities. As a society advances, its income, in connection with a given number of members entering at a particular age, will invariably decrease with the increase of its expenditure. Suppose a society to commence with a given number of members, all 35 years of age; in 25 years afterwards, the income from those members, through the deaths that take place in that period, will have decreased to seven-tenths of its original amount; while its expenditure on sickness will have tripled, and the members will be fast approaching a time of life at which the expenditure will be ten times the original sum. This is a state of things for which the contributions of a society should make ample provision; but, unfortunately, few have so considered the subject as to prepare themselves for such vicissitudes.

But perhaps the most simple and correct mode of looking at the liabilities of those societies is to consider the most improved class of them, in which separate contributions are made for each benefit offered; and in this instance also the contributions answering to age 35 only will be spoken of.

No doubt societies may seriously err by having badly graduated Tables; and it might happen that the contributions at one period of life are abundant, while at other periods they may be quite inadequate; but as a very general view only is to be here taken of the subject, reference is made to the Tables themselves for information on the graduation of rates.

A distinction in the contributions for the various benefits offered, is a valuable improvement in the management of such societies; and accordingly collateral improvements accompany it; for in this class of societies it is found that the annual contribution for a sickness benefit only is nearly equal to that of the other group of societies referred to for the whole three benefits. To secure £1 per week during sickness, the contribution is £1 10s. 10d. yearly, which is only 1s. 10d. less than the yearly contribution in the other societies for all the benefits combined; but it has already been shewn, that the real



risk incurred from sickness by members entering at age 35, would require a payment of £2 7s. 9½d. annually.

No doubt many societies are on a much better foundation than the above statement would seem to indicate; but it has been thought the better course to refer to the societies as a class. A subdivision, however, of the same group was found in a better condition, and the annual payment was about £2 for £1 per week in sickness. No society had its sickness contributions equal to the rates in the preceding Table; but the payments in one society were much more than in the others, having been £2 6s. 11d. annually. The necessity for a general revision of the sickness rates and contributions in friendly societies is therefore obvious.

With respect, however, to those societies distinguishing the rates of contributions for sums of money payable at death, or what is generally termed assurances at death, a better state of things is found to exist. The contribution, on the average, of those societies is 4s. 7d. annually for £10 payable at death, while the exact risk, according to page 474, requires a payment of 4s. 0½d. This latter sum does not include anything for expenses of management. If it were the practice for those societies to keep distinct funds for each of the benefits offered, and never to allow the contributions for assurances at death to be mixed up with the monies arising from other sources, little danger need be feared by those making a provision for death; but, unfortunately, such a separation of the funds is rarely observed, and the general result is, that the assurance fund is absorbed by the deficiencies in the other business of the society. It may be here necessary to remark, that although the preceding sum is, on the average, quite adequate to meet the contingencies from death of all societies, yet there are societies in particular localities, the members of which follow unhealthy occupations, and, in those instances, such a sum would not be sufficient to meet all the liabilities from death.

The most remarkable deficiency yet observed, even among those societies that have graduated rates as well as distinct contributions for the various benefits offered, is in the contributions which provide for an annuity after attaining a given age. At page 471 will be found the values of deferred annuities, to commence at age 70; and the annual premium for the same annuity may easily be obtained from the expression—

$$\frac{\delta}{1 + \theta}$$

in which  $\delta$  represents the terms found at the respective ages on page 471, and  $\theta$  the corresponding terms in the Table on page 472. Accordingly, at age 35, the annual contribution or premium for an annuity of £13 a-year after attaining the age of 70 is 18s. 10d.; but the rate in some societies is as low as 8s. 11d., and an average of a number of the best societies is 12s. 2½d., while the most favourable rate in any individual society, in the



same group, was 14s. 4½d. The nature of this risk has already been referred to at page 484, and the remarks there made should be carefully considered by every one interested in the progress of friendly societies, as no error carries with it such distressing and melancholy consequences as that which aggravates the cares, anxieties, and infirmities of old age, and in the decline of life leaves those destitute whose youthful industry enabled them to live in comparative independence.

Another feature which particularly marks the older class of friendly societies, and which deserves attention, is a want of graduation in the premiums or rates of contribution. This feature, although generally associated with inadequate rates, is not of itself evidence of instability, but is rather a principle which is non-equitable to the members. The better constituted friendly societies have long discontinued such a plan, and have now Tables graduated according to age; but as there are still many societies not so improved, it is proposed to add a few observations on the nature of this error, which is most strikingly developed in the management of Odd Fellow Societies.

For example, one member with another, in passing from 20 to 30 years of age, will experience about 8½ weeks' sickness during the ten years, but in passing from 60 to 70 years of age, he will be subject to above 77 weeks' sickness, and in the ten years immediately following age 70, he would experience 205 weeks' sickness. This gradual increase of sickness with an increase of age, cannot fail to demonstrate that it would be anything but equitable to admit members at every period of life on the same terms. Viewed as a money question, it will be seen, (Table A Q) that at age 20, the sum of £36 4s. 1d., paid down, would provide £1 a-week during sickness up till age 70, but that, at age 40, £48 16s. 7½d. would be necessary; and, therefore, if it were the practice of lodges to admit members at those ages, on equal terms, the older members must be supported, to a great extent, at the expense of the younger. A similar relation will be found to prevail with regard to the provisions for allowances at death.

If the money values for the preceding benefits were determined according to the experience of the members of the Manchester Unity itself, they will be found not to differ very widely. It has already been stated with regret, that Mr. Ratcliffe, in calculating his monetary tables, employed the Odd Fellow data beyond the age of 65, though they were evidently defective subsequent to that age, from the very small number of persons over whom the observations were made: and as the data for the twenty years preceding that period, approximate in a very remarkable manner to the results in these Contributions, there is every reason to believe, that if after the age of 65, the data of the Odd Fellows' experience had been sufficiently ample, an equally close approximation would have shewn itself. At all events the data in this Work, in the advanced stage of life, being of forty times the magnitude, should, seeing that the other is obviously defective, be used in preference. In constructing the following Tables, therefore, to



determine the money values for the different benefits described, the rate of sickness as actually experienced by the Unity, between ages 40-65, is taken from Mr. Ratcliffe's Table VII, page 19, and, subsequent to that age, from Table E, pp. 26-7 *ante*. Again, under the age of 40, the somewhat reduced ratio of sickness shewn in the returns of the Unity, must, on a careful consideration of the preceding remarks, be regarded as a temporary feature connected with the experience of the Order, as there are the strongest reasons to believe that should the different lodges become more stable, and cease to be agitated by the questions which have caused so much discussion during the last five or six years, the diminished fluctuation of members, at the younger ages, must have the effect of producing a higher ratio of sickness at the earlier periods of life, equalling, if not exceeding, that shewn in Table E. Hence, in constructing the following Table A U, the ratio of sickness for ages under 40 are the same as in Table E. There is, however, another element which enters into the consideration of this Table, viz. the rate of mortality. By the following Abstract it will be seen that the rate of mortality among the members of the Unity is intermediate between that for the whole population of England and Wales, and that for friendly societies in general. The following are the results for the different classes:—

| Age.      | Mortality per Cent. deduced from the data for      |                                            |                                 |
|-----------|----------------------------------------------------|--------------------------------------------|---------------------------------|
|           | England and Wales<br>whole population,<br>Table C. | Manchester Unity,<br>Ratcliffe, pp. 19—20. | Friendly Societies,<br>Table F. |
| 21 to 25  | ·876                                               | ·7561                                      | ·6838                           |
| 26 ... 30 | ·998                                               | ·8058                                      | ·7295                           |
| 31 ... 35 | 1·063                                              | ·8788                                      | ·7966                           |
| 36 ... 40 | 1·157                                              | ·9340                                      | ·8786                           |
| 41 ... 45 | 1·319                                              | 1·2259                                     | 1·0287                          |
| 46 ... 50 | 1·560                                              | 1·4818                                     | 1·2571                          |
| 51 ... 55 | 1·935                                              | 2·1849                                     | 1·6812                          |
| 56 ... 60 | 2·529                                              | 2·8282                                     | 2·2249                          |
| 61 ... 65 | 3·474                                              | 4·5826                                     | 2·9262                          |
| 66 ... 70 | 4·947                                              | 6·8571                                     | 4·4885                          |
| 71 ... 75 | 7·243                                              | 6·7961                                     | 7·0928                          |
| 76 ... 80 | 10·924                                             | 9·5237                                     | 8·5140                          |
| 81 ... 85 | 16·206                                             | 12·5000                                    | 12·5874                         |

From the above Abstract it will be seen that the rate of mortality under the age of 50 is, in the Manchester Unity, intermediate between the two other classes, but from that age to 70, the rate is higher; it consequently follows that, so far as the experience of the Unity extends, the members are subject to a rate of mortality differing from the other two. It has already been stated that, after the age of 65, the Odd-Fellow data is too limited to be relied on in regard to sickness, and the same observation applies with greater force in respect to mortality.

In constructing the following Table, therefore, the actual rate of mortality observed in the Manchester Unity, up to the age of 65, will be taken, but, after that age, a rate intermediate between the other two classes of results.



It is unnecessary here to enter into the details of the method followed in order to determine from the preceding facts the rates of mortality and sickness for specific ages, and to construct the preliminary Tables thence arising, preparatory to the formation of the following Table. Those wishing to follow up that part of the question, will find the methods fully explained and exemplified in the Contribution on the Rate of Mortality among Persons of Intemperate Habits, pp. 206-17 *ante*.

TABLE A U.

| Age. | D.    | N.      | D <sup>s</sup> | N <sup>s</sup> | Age. | D.     | N.      | D <sup>s</sup> | N <sup>s</sup> |
|------|-------|---------|----------------|----------------|------|--------|---------|----------------|----------------|
| 15   | 64186 | 1454957 | 50210          | 2937975        | 58   | 10894  | 119385  | 37393          | 1371311        |
| 16   | 61966 | 1392991 | 49328          | 2887765        | 59   | 10277  | 109008  | 36836          | 1333918        |
| 17   | 59792 | 1333199 | 48304          | 2838437        | 60   | 9629.2 | 99478.6 | 37502          | 1297082        |
| 18   | 57669 | 1275530 | 47100          | 2790133        | 61   | 8977.0 | 90501.6 | 39074          | 1259580        |
| 19   | 55602 | 1219928 | 45522          | 2743033        | 62   | 8341.0 | 82160.6 | 41302          | 1220506        |
| 20   | 53602 | 1166326 | 44096          | 2697511        | 63   | 7734.6 | 74426.0 | 43938          | 1179204        |
| 21   | 51665 | 1114661 | 42809          | 2653415        | 64   | 7165.4 | 67260.6 | 46670          | 1135266        |
| 22   | 49792 | 1064869 | 41600          | 2610600        | 65   | 6656.3 | 60604.3 | 49721          | 1088596        |
| 23   | 47981 | 1016888 | 40464          | 2569006        | 66   | 6189.7 | 54414.6 | 52853          | 1038875        |
| 24   | 46232 | 970657  | 39809          | 2528542        | 67   | 5753.3 | 48661.3 | 55850          | 986022         |
| 25   | 44543 | 926113  | 38881          | 2488733        | 68   | 5338.0 | 43323.3 | 58523          | 930172         |
| 26   | 42912 | 883201  | 37796          | 2449852        | 69   | 4938.0 | 38385.3 | 59717          | 871649         |
| 27   | 41336 | 841865  | 36571          | 2412056        | 70   | 4540.1 | 33845.2 | 60931          | 811932         |
| 28   | 39814 | 802051  | 35342          | 2375485        | 71   | 4151.6 | 29693.6 | 61861          | 751001         |
| 29   | 38343 | 763708  | 33621          | 2340143        | 72   | 3777.2 | 25916.4 | 62273          | 689140         |
| 30   | 36916 | 726792  | 32296          | 2306522        | 73   | 3420.4 | 22496.0 | 62021          | 626867         |
| 31   | 35535 | 691257  | 31299          | 2274226        | 74   | 3082.6 | 19413.4 | 62958          | 564846         |
| 32   | 34201 | 657056  | 30562          | 2242927        | 75   | 2772.2 | 16641.2 | 61716          | 501888         |
| 33   | 32915 | 624141  | 29996          | 2212365        | 76   | 2482.8 | 14158.4 | 58871          | 440172         |
| 34   | 31675 | 592466  | 30115          | 2182369        | 77   | 2210.8 | 11947.6 | 54891          | 381301         |
| 35   | 30489 | 561977  | 29949          | 2152254        | 78   | 1954.4 | 9993.2  | 50172          | 326410         |
| 36   | 29348 | 532629  | 29637          | 2122305        | 79   | 1713.1 | 8280.1  | 43090          | 276238         |
| 37   | 28246 | 504383  | 29192          | 2092668        | 80   | 1477.4 | 6802.7  | 37298          | 233148         |
| 38   | 27178 | 477205  | 28704          | 2063476        | 81   | 1258.1 | 5544.6  | 32477          | 195850         |
| 39   | 26140 | 451065  | 27813          | 2034772        | 82   | 1061.0 | 4483.6  | 28354          | 163373         |
| 40   | 25120 | 425945  | 27223          | 2006959        | 83   | 841.10 | 3642.53 | 24720          | 135019         |
| 41   | 24123 | 401822  | 26904          | 1979736        | 84   | 737.73 | 2904.80 | 22136          | 110299         |
| 42   | 23154 | 378668  | 26781          | 1952832        | 85   | 617.73 | 2287.07 | 19442          | 88163          |
| 43   | 22213 | 356455  | 26852          | 1926051        | 86   | 516.05 | 1771.02 | 16657          | 68721          |
| 44   | 21301 | 335114  | 27681          | 1899199        | 87   | 426.52 | 1344.50 | 13840          | 52064          |
| 45   | 20429 | 314725  | 28178          | 1871518        | 88   | 346.27 | 998.23  | 11085          | 38224          |
| 46   | 19588 | 295137  | 28485          | 1843340        | 89   | 274.46 | 723.77  | 8735.5         | 27139          |
| 47   | 18771 | 276366  | 28646          | 1814855        | 90   | 213.42 | 510.35  | 6601.0         | 18403.4        |
| 48   | 17973 | 258393  | 28773          | 1786209        | 91   | 161.87 | 348.48  | 4724.3         | 11802.4        |
| 49   | 17191 | 241202  | 28708          | 1757436        | 92   | 118.89 | 229.586 | 3146.0         | 7078.1         |
| 50   | 16409 | 224793  | 28857          | 1728728        | 93   | 83.776 | 145.810 | 1896.0         | 3932.1         |
| 51   | 15637 | 209156  | 29225          | 1699871        | 94   | 56.018 | 89.792  | 1081.4         | 2036.1         |
| 52   | 14881 | 194275  | 29806          | 1670646        | 95   | 36.223 | 53.569  | 563.75         | 954.72         |
| 53   | 14147 | 180128  | 30606          | 1540840        | 96   | 22.757 | 30.812  | 259.84         | 391.15         |
| 54   | 13434 | 166694  | 32745          | 1510234        | 97   | 13.989 | 16.823  | 96.656         | 131.31         |
| 55   | 12770 | 153924  | 34284          | 1477489        | 98   | 8.4949 | 8.3278  | 17.500         | 34.656         |
| 56   | 12134 | 141790  | 35456          | 1443205        | 99   | 5.1562 | 3.1716  | 10.622         | 17.156         |
| 57   | 11511 | 130279  | 36438          | 1407749        | 100  | 3.1716 | 0.0000  | 6.5337         | 6.5337         |



Column D of the preceding Table has been formed from the expression  $l_m v^m$ , in which  $l_m$  represents the numbers living at the age  $m$ , according to the actual experience of the Order, and  $v^m$  represents the present value of £1 due at the end of  $m$  years at 3 per cent.: also,

$$D_m = \text{quantity in col. D at any given age } m; \text{ and}$$

$$D_{m+x} = \dots \dots \dots \text{at any variable higher age } m+x.$$

And in the same Table  $N_m = \Sigma D_m + 1$ .

The columns  $D^s$  and  $N^s$  are formed on a similar principle:—

Let  $s_m$  = the amount of sickness annually to each person, aged  $m$ , expressed in weeks;

$$\text{And } z_m = s_m v^{\frac{1}{2}}$$

$$\text{Then, as } D_m = l_m v^m$$

$$\therefore D_m^s = D_m z_m$$

$$\text{And } N_m^s = \Sigma D_m^s$$

The following three Tables contain a condensed Abstract of the monetary values deduced from Table A U, which represents the experience of the Order in accordance with actual observation.

TABLE A V.

*Value of an Annuity of £1 yearly, calculated from the actual experience of the Order.*

| Age. | Immediate Annuity for the whole of life. | Deferred Annuity to commence at age 70. | Temporary Annuity to continue till age 70. |
|------|------------------------------------------|-----------------------------------------|--------------------------------------------|
|      | £ s. d.                                  | £ s. d.                                 | £ s. d.                                    |
| 20   | 21.7585 = 21 15 2                        | .6314 = 0 12 7½                         | 21.1271 = 21 2 6½                          |
| 30   | 19.6879 = 19 13 9                        | .9168 = 0 18 4                          | 18.7711 = 18 15 5                          |
| 32   | 19.2119 = 19 4 2¾                        | .9896 = 0 19 9½                         | 18.2223 = 18 4 5½                          |
| 40   | 16.9563 = 16 19 1½                       | 1.3473 = 1 6 11½                        | 15.6090 = 15 12 2¼                         |
| 50   | 13.6993 = 13 13 11¾                      | 2.0626 = 2 1 3                          | 11.6367 = 11 12 8¾                         |
| 60   | 10.3309 = 10 6 7½                        | 3.5149 = 3 10 3½                        | 6.8160 = 6 16 3¾                           |
| 70   | 7.4547 = 7 9 1                           |                                         |                                            |
| 80   | 4.6045 = 4 12 1                          |                                         |                                            |



TABLE A W.

*Premiums to Assure the sum of £1 Payable at Death, calculated from the actual experience of the Order.*

| Age. | Single Payment. | Yearly Payment to be payable during the whole of Life. | Yearly Payment to be payable up till Age 70. |
|------|-----------------|--------------------------------------------------------|----------------------------------------------|
|      | s. d.           | s. d.                                                  | s. d.                                        |
| 20   | ·33713 = 6 9    | ·01481 = 0 3½                                          | ·01526 = 0 3½                                |
| 30   | ·39744 = 7 11½  | ·01921 = 0 4½                                          | ·02023 = 0 5                                 |
| 32   | ·41131 = 8 2¾   | ·02035 = 0 5                                           | ·02155 = 0 5½                                |
| 40   | ·47700 = 9 6½   | ·02657 = 0 6½                                          | ·02904 = 0 7                                 |
| 50   | ·57186 = 11 5½  | ·03890 = 0 9½                                          | ·04627 = 0 11½                               |
| 60   | ·66997 = 13 4¾  | ·05913 = 1 2½                                          | ·09122 = 1 10                                |
| 70   | ·75374 = 15 1   | ·07082 = 1 5                                           |                                              |
| 80   | ·83676 = 16 8¾  | ·14930 = 2 11¾                                         |                                              |

TABLE A X.

*Payments necessary to provide for an Allowance of £1 per Week during Sickness, calculated from the actual experience of the Order.*

| Age. | To provide a Sick Allowance up till Age 70. |                                         |  | To provide a Sick Allowance during the whole of Life. |                                        |  |
|------|---------------------------------------------|-----------------------------------------|--|-------------------------------------------------------|----------------------------------------|--|
|      | Single Payment.                             | Annual Payment to continue till Age 70. |  | Single Payment.                                       | Annual Payment to continue till Death. |  |
|      | £ s. d.                                     | £ s. d.                                 |  | £ s. d.                                               | £ s. d.                                |  |
| 20   | 35·1779 = 35 3 6½                           | 1·59592 = 1 11 11                       |  | 50·3246 = 50 6 6                                      | 2·21126 = 2 4 2¾                       |  |
| 30   | 40·4865 = 40 9 8¾                           | 2·06058 = 2 1 2½                        |  | 62·4813 = 62 9 7½                                     | 3·02016 = 3 0 4¾                       |  |
| 32   | 41·8408 = 41 16 9¾                          | 2·19185 = 2 3 10                        |  | 65·5843 = 65 11 8¼                                    | 3·24481 = 3 4 10¾                      |  |
| 40   | 47·5718 = 47 11 5½                          | 2·89574 = 2 17 11                       |  | 79·8969 = 79 17 11½                                   | 4·44959 = 4 8 11¾                      |  |
| 50   | 55·8715 = 55 17 5½                          | 4·52022 = 4 10 5                        |  | 105·3538 = 105 7 1                                    | 7·16721 = 7 3 4½                       |  |
| 60   | 50·3825 = 50 7 7¾                           | 6·85978 = 6 17 2½                       |  | 134·7038 = 134 14 1                                   | 11·88803 = 11 17 9½                    |  |

The formula for the construction of Tables A V and A W will be found in all the recently published works on Life Annuities, and the results given in Table A X may be easily determined from Table A U, as follows:—

$$\frac{N_m^s}{D_m} = \text{Results in column No. 4, Table A X.}$$

$$\frac{N_m^s}{N_{m-1}^s} = \text{Do. Do. No. 5, ...}$$

$$\frac{N_m^s - N_{m+n}^s}{D_m} = \text{Do. Do. No. 2, ...}$$

$$\frac{N_m^s - N_{m+n}^s}{N_{m-1}^s - N_{m+n-1}^s} = \text{Do. Do. No. 3, ...}$$



To avoid further argument on the subject, it will be assumed in the future pages of this paper that rates graduated to lower terms than set forth in the preceding Tables would be unsafe for the guidance of the Order. Complete evidence of this is furnished in the analysis of the facts and elementary data on which the calculations are founded; and the inherent evidence in the various parts of this paper amply demonstrate that the liabilities of the Order have been hitherto quite equal to those anticipated in these calculations. It therefore remains to determine whether the contributions exacted by the Order are such as are calculated to maintain the stability of the Institution, and realise the benefits promised to the members. It may be also as well to mention, that in the discussion of this point no statement will be advanced for which facts and examples both in and out of the Order do not exist. This is believed to be the only satisfactory mode of treating such a question. Unless ample data be available, it is impossible to measure the liabilities; but with sufficient data, it becomes a matter of certainty and of simple calculation, and the province of mere opinion is ceded to positive evidence, to which all must submit who can comprehend the argument.

It is not thought necessary to refer at this place to the rates and contributions hitherto demanded by the various lodges in the Unity, but to take up the question as to whether the scales drawn up by the Board of Directors at Manchester, and proposed some time since by the Glasgow A. M. C., are safe, and calculated to meet all the liabilities of the Order. Any arguments used in reference to those scales, whether in favour of their adoption or otherwise, will apply with greater or less force to the present rates of any particular lodge, according as they are greater or less than those of the proposed scale. This course is inevitable, as it is impossible to discuss the rules of each lodge *seriatim*.

In the Manchester Unity, during the year 1844, the total number of weeks' sickness experienced by the members was 226917, and the amount of money paid to sick members was £107,440 8s. 11d.: it hence follows that for each weeks' sickness there was paid about 9s. 6d. As a standard of comparison it may therefore be assumed that the general practice of the Unity is to pay 10s. per week in sickness, and we shall test the accuracy of the proposed scales on this ratio. Some lodges no doubt pay more, and others less, to their members, than the above average: but if the terms are calculated for 10s. per week, it will then be easy to determine the rate for any other particular scale of payment.

In the first instance reference will be made to scale No. 1, or manufacturing class, as prepared by the Board of Directors, and recommended to be adopted. The average age of the members of the Unity was stated to be then 32 years; and making that the point of comparison, it will be found that a weekly payment of 5d. by the members is to provide for them the following benefits, viz.:

|     |    |   |                                  |
|-----|----|---|----------------------------------|
| £0  | 10 | 0 | per week during sickness,        |
| £10 | 0  | 0 | at the death of a member, and    |
| £5  | 0  | 0 | at the death of a member's wife. |



But it will also be found that in addition to the 5*d.* per week, each member has paid entrance money, which for age 32 is equivalent to an annual payment of 1*s.* 1*d.* A payment of 5*d.* weekly is equal to a yearly sum of £1 1*s.* 8*d.*; and to this add 1*s.* 1*d.*, and the full yearly payment will be £1 2*s.* 9*d.*

Let us next determine how far this payment is calculated to meet the liabilities of the Order, according to the data already alluded to.

|                                                                     |    |    |    |
|---------------------------------------------------------------------|----|----|----|
| On reference to Table A S, it will be found that the annual pay-    | £  | s. | d. |
| ment at age 32 for an allowance of 10 <i>s.</i> per week during     |    |    |    |
| sickness, to continue to the extreme of life, is . . . . .          | 1  | 14 | 4½ |
| For £10 at death of a member, age 32, Table A M . . . . .           | 0  | 3  | 8½ |
| To provide £5 at the death of a member's wife, (the deaths being    |    |    |    |
| in the ratio of 1650 to 2286 of the members themselves—see          |    |    |    |
| Table A Y), the payment will be . . . . .                           | 0  | 1  | 4  |
| Total payment required for the three benefits promised by the Order | £1 | 19 | 5  |

The payment necessary to provide for the benefits promised will thus be seen to amount to £1 19*s.* 5*d.* to each member yearly, but the actual sum demanded according to the new scale, No. 1, is only £1 2*s.* 9*d.*, being about 42 per cent. less than the terms necessary to enable the Unity to meet its engagement. It should be kept in view that in the preceding calculation nothing is allowed for expenses of management, so that the sum of £1 19*s.* 5*d.* is absolutely necessary to meet the various liabilities without any deductions whatever.

Again: according to Table A U preceding, constructed on the actual experience of the Order, the following are the rates necessary to provide the same benefits, viz.:—

|                                                                      |   |    |       |
|----------------------------------------------------------------------|---|----|-------|
| Yearly payment required at age 32, on account of an allowance of     |   |    |       |
| 10 <i>s.</i> per week during sickness, to continue to the extreme of |   |    |       |
| life, is, according to Table A X, preceding . . . . .                | = | £1 | 12 5½ |
| For £10 at death of a member at age 32, Table A W . . . . .          | = | 0  | 4 1   |
| To provide £5 at the death of a member's wife (the deaths being      |   |    |       |
| in the ratio of 1650 to 2286 of members themselves—see               |   |    |       |
| Table A Y) . . . . .                                                 | = | 0  | 1 5½  |
| Total payment required for the three benefits promised by the        |   |    |       |
| Order, and according to the data derived from the experience         |   |    |       |
| of the Unity . . . . .                                               | = | £1 | 18 0  |

This result is of vital importance, and should receive the immediate and earnest attention of the members. It is believed that the form in which the present evidence is



given, will enable any one of ordinary intelligence to test all the figures, and thoroughly satisfy his own mind of the perilous condition in which the Order is at present placed.

From a succeeding Table, A Y, it will be seen that the annual income of the Order, under the head of contributions, is £245,842 13s. 8d., and, according to the preceding figures, there would still be an annual deficiency of no less than £209,688 11s. 10d. The awful calamity which must await the Order under such circumstances cannot fail to alarm the members as to the terrible consequences which must inevitably follow their neglect or indifference in carrying out the radical reforms necessary in their constitution. Truly, in such an event, the sins of the fathers will be visited on the third and fourth generations. A quarter of a million of men have now the opportunity of perpetuating one of the most useful institutions ever developed by the working classes of any country. Under proper regulations, it may be the direct means of elevating the moral and physical condition of a vast body of the rising generation, and imparting a social character and importance to the industrious and provident classes which they have never yet acquired; but, to participate in those advantages, it is absolutely necessary that a great movement should be made towards financial reform in the institution. Let, therefore, every member say to himself, "I will put my shoulder to the wheel,—I will make an effort, which I am certain is quite within my power,—I will do that, as an individual, which others have done in smaller institutions, and which is only just and equitable,—I will listen to the warning which science and experience set before me, and I shall then have the satisfaction of believing that I have done the best that could be done; I shall feel convinced, that with good and economical management, our institution will survive and prosper,—it will really and truly be the support of my declining years; when the infirmities of old age creep upon me, I shall have the consolation of falling back on the industrious savings of vigorous youth. My family will be induced to follow my example. With my friends and neighbours all petty jealousies will be set aside,—we shall unite in promoting our own and our children's welfare; and while we profess to unite in the bonds of true fellowship, let us honestly exclaim—

" Two are better than one;  
If they fall, the one will lift up his fellow;  
But woe to him that is alone when he falleth,  
For he hath not another to help him up."

Again: as it has been shewn that the proposed scale, No. 1, would occasion an annual deficiency in the income of £209,688 11s. 10d., the following figures will point out what amount of contribution would be required at the present moment to make up that deficiency.

The present value of an annuity on a life of 32 is 19.98129 (see Table A H), or nearly 20 years' purchase; so that if the contributions were to continue on the scale now proposed,



each member would need to pay down at present the sum of £16 9s. 8d. (16·984), to make up future deficiencies in his annual payments.

But as there were 251727 members in the Unity in January 1845, these two items multiplied together will produce the sum of £4,275,181. From this subtract £700,000, the capital stock of the Order at the same period, and £3,575,181 will be the payment that should be made in order to place Odd Fellows on a secure foundation, with their proposed scale of contributions.

The members, however, must keep in view that should no such donation be now made to the society, then the ultimate deficiency under their proposed rates will be much more than £3,575,181; for in order to enable that sum to meet all the demands on the society it should be invested to yield 3 per cent. compound interest. As there is no chance, however, of any such donation, the ultimate deficiency will be about ten millions.

But there is another, and perhaps a simpler mode by which members may satisfy themselves of the inadequacy of the proposed scales. On referring to Table V, page 409 of this Contribution, it will be found that at age 32, which is the average age of members in the Unity, the amount of sickness per annum to each is ·9250 weeks, or 6 days 11 hours to each member; and as, over the whole Unity, the payment for a week's sickness is 9s. 6d., that will average to each member yearly 8s. 9½d., but by Table V it will be seen that the actual expenditure on sickness during 1844, was 8s. 10¼d. to each member. We have, therefore, so far a most satisfactory confirmation that the data of these Contributions is applicable to the Order; and carrying out the reasonings on the same basis, it will follow that at the present time there should be an annual saving on the income of each member's contributions for sickness alone of £1 5s. 1d.; but the actual saving on this item was only about 11s. 4d., and on the total income of all the Lodges there was a saving to each member during the same year of about 26 per cent. only; while under a proper graduation of the contributions, the saving would have been at least 75 per cent., or three times the actual amount. To this it may be replied, that the illustration may faithfully represent the former condition of the Unity, but it is not applicable to the new scale. An inspection, however, of Table A Y will shew that during the year 1844, the receipts from each member over the whole Unity, in the shape of contributions, was about £1 0s. 2½d., while the amount proposed to be levied under scale No. 1, is £1 1s. 8d. for 10s. weekly during sickness, and the collateral benefits; but as the average sick allowance in 1844 was only 9s. 6d. per week, the corresponding contribution for the full benefits of scale No. 1, would be £1 1s. 3d. yearly, differing only by 5d. from the terms of the proposed scale. It is, consequently, evident that the preceding arguments, drawn from the past experience of the Order, are equally applicable to the proposed scale of payments.

It will thus be seen that the proposed scale No. 1, instead of demanding an increased rate of contributions from the members, is just leaving them in the same position in which they were placed during 1844. The effect of that scale is not to increase the income of



the Order, but to produce an uniformity between the income and expenditure of the various lodges. From the violent opposition offered to its adoption, the innumerable dissensions and bickerings, and the many angry discussions to which the proposal has given birth, there can be no doubt that the popular belief is, that the tendency of the proposed scale is to increase the payments by members. It is also evident that the intention of the Glasgow A. M. C. and the Board of Directors at Manchester, was to augment the amount of the contributions; and that they have not done so, can only have arisen from their own ignorance of what was the condition of the various lodges at the period referred to. The following analysis of the money condition of the Order during 1844 will, however, set the question at rest, and enable any one to prove the above facts for himself. It may also be stated that the classification adopted is identical with that set forth in Table A Z, page 506 of this Contribution.

TABLE A Y.

*Income and Expenditure of the Manchester Unity during the Year 1844.*

| Districts.         | Number of Members, Jan. 1, 1844. | Average No. of Members during 1845. | Income from    |    |    |              |    |    |                   |    |    | Expenditure on |    |    |               |    |    |           |    |    |
|--------------------|----------------------------------|-------------------------------------|----------------|----|----|--------------|----|----|-------------------|----|----|----------------|----|----|---------------|----|----|-----------|----|----|
|                    |                                  |                                     | Contributions. |    |    | Initiations. |    |    | Fines, Goods, &c. |    |    | Sickness.      |    |    | Funerals, &c. |    |    | Sundries. |    |    |
|                    |                                  |                                     | £              | s. | d. | £            | s. | d. | £                 | s. | d. | £              | s. | d. | £             | s. | d. | £         | s. | d. |
| Rural .            | 68553                            | 66208                               | 62072          | 5  | 0  | 10544        | 19 | 2  | 7875              | 2  | 3  | 26849          | 3  | 4  | 14697         | 6  | 2  | 16303     | 1  | 6  |
| Town .             | 79790                            | 77070                               | 74959          | 4  | 11 | 14295        | 18 | 10 | 9429              | 1  | 0  | 32617          | 3  | 8  | 19342         | 10 | 11 | 21637     | 1  | 8  |
| City .             | 103384                           | 99848                               | 108811         | 3  | 9  | 24541        | 11 | 1  | 12671             | 5  | 1  | 47974          | 1  | 11 | 28702         | 14 | 5  | 33480     | 13 | 2  |
| Whole }<br>Unity } | 251727                           | 243126                              | 245842         | 13 | 8  | 49382        | 9  | 1  | 29975             | 8  | 4  | 107440         | 8  | 11 | 62742         | 11 | 6  | 71420     | 16 | 4  |

The above Table furnishes the details of Income and Expenditure for the Rural, Town, and City Districts separately; but the remarks will, in the first place, be confined to the results for the whole Unity.

The following is the Income and Expenditure for the whole Order during the year 1844:—

|                                           | <i>Income.</i> | £        | s. | d. |
|-------------------------------------------|----------------|----------|----|----|
| From Contributions . . . . .              |                | 245,842  | 13 | 8  |
| ... Initiations, or Entry Money . . . . . |                | 49,382   | 9  | 1  |
| ... Fines, Goods, and Sundries . . . . .  |                | 29,975   | 8  | 4  |
| Total Income during 1844 . . . . .        |                | £325,200 | 11 | 1  |



|                                                          | <i>Expenditure.</i> | £       | s. | d. |
|----------------------------------------------------------|---------------------|---------|----|----|
| Paid to Sick Members . . . . .                           |                     | 107,440 | 8  | 11 |
| ... For Funerals, District and Widow and Orphan's Fund . |                     | 62,742  | 11 | 6  |
| ... For Sundries . . . . .                               |                     | 71,420  | 16 | 4  |

Total Expenditure during 1844 . . . . . £241,603 16 9

Surplus of Income over Expenditure for the year 1844. £83,596 14 4

Or an annual saving to each member of about 6s. 10½d.

The following will give an idea of the expenses of management of the Order:—

|                                                                    |              |
|--------------------------------------------------------------------|--------------|
| Ratio of Expenses of Management to the whole Expenditure . . . . . | 29 per cent. |
| ... to the amount paid to Sick Members . . . . .                   | 66 ...       |
| ... to the amount paid for Funerals . . . . .                      | 113 ...      |
| ... to the Income from Contributions . . . . .                     | 29 ...       |
| ... to the Total Income . . . . .                                  | 22 ...       |

It is evident that if such an application of the funds be permitted to continue, the dissolution of the Order must be fast approaching. The Directors of the Unity are therefore most imperatively called on to interpose their influence to prevent such a lavish expenditure on the part of the lodges. It will be seen that it is not to one year alone that this enormous outlay is confined, but must have been peculiar to the whole history of the Order. In 1834 the number of members was about 60,000, and at the beginning of the present year the number was 251,727—increase about 19,000 per annum; but in connection with this, a remarkable fact deserving of serious consideration is brought to light by the Directors. They state that “the amount of initiation-money which was received from members in 1844, being no less a sum than £49,382, it will be discovered, on reference to the list of lodges, that our increase of members in that year was only 21,461, and by these returns it is clearly proved that upwards of 40,000 members were initiated in 1844; thereby at once affirming that upwards of 20,000 members left the Order in one year, after paying their initiation-money and contributions for a length of time. We are of opinion that the particular attention of the members of the Order should be drawn to this important fact, with a view of arriving at the true cause why so many leave the Order.” At this rate the total amount of initiation-money received by the Order ought in January 1845 to have realised a capital of £750,000 at least, without any augmentations from other contributions; but it is understood that the whole capital at that time did not exceed £700,000: so that the Unity now finds itself in this position, that they have been proceeding on a plan, by which the contributions are not sufficient to meet the current expenditure, and that they have been actually falling back on the initiation-money of the members. Further argument is not needed to shew the insecurity of any institution when based on such a system. And it ought to be kept in view that



this state of things prevails when the bulk of the members must be very young, and are represented at an average age of 32—a period of life at which the rate of sickness is not equal to one week per annum to each person. Where then is the boasted provision so loudly proclaimed by some to meet the vicissitudes and infirmities of after life, when the rate of sickness per annum will be from 10 to 20 weeks to each member? It is astonishing that people can be so blind to their own interest, and not see the awful calamity which awaits them unless decided improvements are effected in the condition of the Order. In Manchester, the fountain-head of the Unity, the greatest possible opposition has been given to the recent changes suggested by the A. M. C., and carried out by the G. M. and Board of Directors. The most angry and violent manifestation of feeling has evinced itself, threatening dangerous and fearful consequences to the whole Order; and yet in the same district, palpable and obvious examples are to be found of its utter inability to survive long under such a deplorable condition.

In Manchester itself there are 6 lodges established on an average of 11 years; and on the 1st of January 1845, they contained 530 members, and were possessed of funds—to what amount will it be believed possible?—why the lamentably small sum of £91 13s. 6d., or less than one-twelfth of the entrance money which must have been paid into the lodges. Again: there are 12 other lodges, established for an average period of 4½ years, and containing 613 members and their total amount of funds is £313 15s. only. And further: of 33 lodges which have been open for an average period of twelve years, but recently suspended, and which contain 2,774 members, the gross amount of funds they possessed on the 1st of January, 1845, was only £1,379 6s. 6d., or not one-half of the initiation-money paid into the lodges. Yet, with such striking and obvious signs of decay, the Board of Directors are forced to contend against the most ill-conceived opposition. No one with his eyes open can fail to see that the Unity has arrived at that period of its history when its income must of necessity be unable to meet the required expenditure. Out of 100 lodges, containing 11,080 members, the whole of their accumulated capital did not amount to 13s. per member.

It really seems surprising that any evidence beyond this should be wanting to bring conviction to the minds of Odd Fellows, of the urgent need of immediate reform. In some lodges the expense of management absolutely exceeds the amount paid for sick allowance; and in many instances amounts to a sum varying from 8s. to 13s. yearly, to each member; while in others more than half the original contributions are squandered away in the modes of management adopted; and in one district, among 2800 members, the expense of management during the year was about £1100. Nothing could stand this long, even though the rates and contributions were otherwise well graduated. Take the following as an example of the reckless expenditure indulged in by some lodges. That it may not be thought an isolated instance, but of serious and fearful importance, it is only right to mention that the following figures shew the income and expenditure of 14



different districts, containing 297 lodges and 17,059 members, and therefore to be considered by all well-wishers of the Order as demanding immediate redress.

| <i>Income.</i>                                           |  | £       | s. | d. |
|----------------------------------------------------------|--|---------|----|----|
| Amount of Contributions received . . . . .               |  | 21,402  | 15 | 7  |
| Amount of Initiations . . . . .                          |  | 12,436  | 16 | 7  |
| Amount of Fines, Goods, Sundries . . . . .               |  | 3,712   | 4  | 9  |
| Total Income during 1844 . . . . .                       |  | £37,550 | 15 | 11 |
| <i>Expenditure.</i>                                      |  | £       | s. | d. |
| Amount paid to Sick Members . . . . .                    |  | 6,998   | 18 | 3  |
| ... for Funerals, Districts, and Widow and Orphan Funds  |  | 7,566   | 2  | 4  |
| ... for Sundries . . . . .                               |  | 10,497  | 12 | 9  |
| Total Expenditure for 1844 . . . . .                     |  | £25,062 | 13 | 6  |
| Surplus of Income over Expenditure for the year 1844 . . |  | £12,488 | 2  | 7  |

This, perhaps, contains facts of the most extraordinary kind ever yet brought before the public. Many, even among the Odd Fellows themselves, do not see the great moral and social revolution which the existence of such provident institutions is capable of effecting; but so long as a system of destructive and hurtful management prevails, no national or public blessing can flow from them. But reform the abuses—let the working man understand under what a delusive shadow he has placed his hopes—let him see the dangerous gulf into which all the funds of the Order are being carried, and then reflect what must be its fate twenty years hence, should such an awful exhibition of facts be continued—and there is no doubt he will soon perceive that his interests can only be promoted by a speedy removal of the fatal abuses.

The following is the state of the case in the 14 districts just referred to, which contains 297 lodges, and 17,059 members:—

|                                                            |              |
|------------------------------------------------------------|--------------|
| Ratio of Initiation Money to Contribution . . . . .        | 58 per cent. |
| ... Expenses of Management to ditto . . . . .              | 49 ...       |
| ... Management to Amount paid for Funerals . . . . .       | 138 ...      |
| ... Management to Amount paid for Sick Allowance . . . . . | 150 ...      |

Expenses of management actually 150 per cent. of that paid away to sick members! To relieve and give assistance to members during sickness ought to be, and is, the ostensible object of the institution; but here we have an example of that great virtue of charity and social refinement being sacrificed to the idle indulgence and intemperate appetites of a few



men who, when the cause of the sick and the distressed, the widow and the orphan is pleaded, are ready to rise in noisy turbulence to crush the well-intentioned endeavours of those who attempt to sweep away such intolerable abuses.

The recent opposition to the Board of Directors is most reprehensible, and no well-directed mind can look upon it otherwise than with the deepest regret. There never has existed any social and provident institution of anything like the importance of the Manchester Unity of Odd Fellows; neither, perhaps, did such gross abuses ever exist in any other. The real and essential objects of the Order have been overlooked, and rendered secondary to idle pomp and parade; and those funds which were meant to provide for disease and old age have been squandered on the follies and baubles of youth.

Now, however, that the Board of Directors have made a step in the right direction, let them be supported warmly and cordially. This done, a second and greater reformation must soon follow, which will place the Unity on a permanent foundation, and render it the most gigantic and useful institution of the day. Few, at the present time, understand the wonderful operation going on in the social state towards its own regeneration. Poor-laws and other nostrums seem as much to irritate as allay the disease; but here we have a self-supporting body which, although hitherto managed with a total disregard to science and practical experience, yet contain so much of benevolence, love, and social order, that no less than 40,000 yearly of the hard-working sons of toil embrace its genial comforts and solacing charms. What, then, must be its influence, if only guided by the light of reason, science, and experience, when confidence has inspired the nation in the judgment of its laws, and the integrity and practicability of its principles? There is little doubt that thousands for hundreds would join its ranks; and that the national protection against vice and its horrors, which political laws have failed to secure, would be wrought out by the social improvement among the working classes themselves. But to make such an institution permanent and secure, its means must be commensurate with the end in view; its monetary calculations must be correct, and in conformity with those laws of sickness and mortality which are known to influence its whole transactions.

The following is a still further analysis of the Income and Expenditure of the Order during 1844; and an inspection of the fourth column will shew that the average income from each member, in the shape of contribution, was £1 0s. 2½d., as stated in a preceding part of this Contribution, while the total income from each member, from all sources, as set forth in the sixth column, was £1 6s. 9¼d. It may be stated that those items are not calculated on the maximum number of members for that year, but on the mean number as given in Tables Y and A Y. Many useful applications may be made of this Table, but here it is only necessary to refer to a few of the items.

From a consideration of the following facts and figures it is abundantly evident, that so far as the whole Unity is concerned, the proposed scale, No. I, would not be safe; and the next question which arises is, the propriety of scale No. II, as prepared by the G. M.



TABLE A Z.

*Shewing the Proportion of Income and Expenditure in the Manchester Unity for each District, and to each Person, during 1844.*

| Districts.         | Ratio of Expenditure on Sickness to Contributions. | Ratio of Expenditure on Sickness and Funerals to Contributions. | Ratio of Total Expenditure to Total Income. | Income from each Member by Contributions. | Total Income from each Member. | Expenditure on Sickness to each Member. | Total Expenditure to each Member. |
|--------------------|----------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------|-------------------------------------------|--------------------------------|-----------------------------------------|-----------------------------------|
|                    | Per cent.                                          | Per cent.                                                       | Per cent.                                   | £ s. d.                                   | £ s. d.                        | £ s. d.                                 | £ s. d.                           |
| Rural .            | 43·254                                             | 66·932                                                          | 71·870                                      | 0 18 9                                    | 1 4 3 $\frac{3}{4}$            | 0 8 1 $\frac{1}{4}$                     | 0 17 6                            |
| Town .             | 43·513                                             | 69·316                                                          | 74·578                                      | 0 19 5 $\frac{1}{4}$                      | 1 5 7 $\frac{1}{4}$            | 0 8 5 $\frac{3}{4}$                     | 0 19 1 $\frac{1}{4}$              |
| City .             | 44·089                                             | 70·466                                                          | 75·438                                      | 1 1 9 $\frac{1}{2}$                       | 1 9 3                          | 0 9 7 $\frac{1}{4}$                     | 1 2 0 $\frac{3}{4}$               |
| Whole }<br>Unity } | 43·702                                             | 69·224                                                          | 74·293                                      | 1 0 2 $\frac{1}{2}$                       | 1 6 9 $\frac{1}{4}$            | 0 8 10 $\frac{1}{4}$                    | 0 19 10 $\frac{3}{4}$             |

and Board of Directors, being adopted by the agricultural classes. The relation which scale No. II bears to scale No. I is that of 4*d.* to 5*d.*; or in other words, the same benefits for which the manufacturing classes are required to pay 5*d.* per week, the agricultural classes are required to pay only 4*d.* per week, or 20 per cent. less. Let us, therefore, examine whether there be sufficient reason for adopting two scales of contributions, and making the above distinction between the manufacturing or Town Districts, and the agricultural or Rural Districts.

On turning to Tables V and Y, it will be found that they represent the relative amount of sickness in the various districts according to the experience of friendly societies, and also according to the experience of the Unity itself; and as both classes of results agree so nearly, the monetary expressions deduced from the one may be held to represent the other.

The regulations of the Unity imply that allowances will be given in sickness, or during incapacity for labour, till the extreme of life, but the monetary Tables for the various districts provide for sickness to 70 years of age only. It will, however, be found that a deferred annuity, after that term of life, of half the amount, combined with the other, will be nearly equivalent to an allowance in sickness during the whole term of life. And the following illustration will shew their relative values. In Table A S, page 480, it will be found that, at the age of 30, the annual premium, for an allowance of £1 per week in sickness, during the whole period of life, is about £3 7*s.* 6*d.* Now, the annual premium for the same allowance up to age 70 is about £2 1*s.*, and the annual premium for a deferred annuity of 10*s.* per week after the age of 70 (Table A I, page 471), is £1 9*s.* 4*d.*; total annual premium for both, £3 10*s.* 4*d.* The difference between this sum and the preceding is, therefore, not so much as materially to affect the comparison.



Let us see, then, what annual payment would be required, in each district, for the following benefits, viz.:—10s. per week in sickness till the age of 70; £10 at the death of a member; a deferred annuity of 5s. per week at the age of 70; and £5 at the death of a member's wife,—which are equivalent to the benefits proposed in scale No. 1, or manufacturing class. The following shews the yearly payment which should be charged at the age of 30, for each of those benefits in the three districts, as well as in the three districts combined, which last group may be considered to represent the whole Unity:—

| Description of Benefit.            | Rural Districts*. | Town Districts*. | City Districts*. | The Three Districts combined. |
|------------------------------------|-------------------|------------------|------------------|-------------------------------|
|                                    | £ s. d.           | £ s. d.          | £ s. d.          | £ s. d.                       |
| 10s. per Week during Sickness . .  | 0 19 2            | 1 3 2            | 1 1 3            | 1 0 6                         |
| Deferred Annuity of 5s. per Week . | 0 16 7            | 0 11 0           | 0 10 10          | 0 14 8                        |
| £10 at the Death of a Member . .   | 0 3 5             | 0 3 11           | 0 4 4            | 0 3 8                         |
| £5 at Death of Member's Wife . .   | 0 1 3             | 0 1 7            | 0 1 6            | 0 1 4                         |
| The above four combined . .        | 2 0 5             | 1 19 8           | 1 17 11          | 2 0 2                         |

The figures in the above Abstract may be regarded as an approximation to the relative liabilities of the lodges in the various districts as near as our present knowledge will admit of arriving; and it is somewhat curious to observe, that those places or districts usually thought most hazardous are actually least so. There is no doubt that the members of the Glasgow A. M. C., in resolving to adopt two scales of contributions, were impressed with the belief that the lodges in the Town and City Districts were subject to greater liabilities than those in the Rural or Agricultural Districts, but the facts of the case will be seen to be otherwise. The error has, in all probability, arisen from supposing that the risks of the various districts would bear the same relation to each other as the rates of mortality among the members of those districts. In fact, the propriety of having two scales has been generally argued on that shewing; and under a cursory survey of the question, the one opinion was, perhaps, a natural enough sequence of the other; but a more comprehensive view of the subject will shew that the legitimate effect of increased mortality is to diminish the liabilities of the lodges, instead of increasing them as has been supposed.

It will be seen by an inspection of the figures in the preceding Abstract that the risk incurred from sickness, greatly exceeds that from the mortality of the members.

\* For the Rates applicable to the Rural, Town, and City Districts respectively, see pp. 471, 474, and 479.



Expressed in money, the relative values of those two items for each member entering a lodge at the age of 30, are—

|                                         |         |
|-----------------------------------------|---------|
| For 10s. per week in sickness . . . . . | £34 7 4 |
| For £10 at death . . . . .              | 3 14 10 |

the one being more than nine times that of the other. It has been equally well established, that increased mortality is not always accompanied with an increased rate of sickness; and the direct consequence of these two facts is to render the liabilities of lodges in what are usually called the healthy districts, actually greater in some cases than in the less favoured districts. For an illustration compare the Rural Districts in the preceding Abstract with the City District. The apparent anomaly may be explained in this way:—If 100 members, at the age of 30, were to enter a lodge in a Rural District, and at the same time 100 members of the like age were to enter another lodge in a City District, the result would be, that 40 years hence, when the surviving members had attained 70 years of age, in the Rural Districts 52 of the original 100 members would still be alive, while in the City District 38 only would reach that period of life. Well then, to carry out this illustration, suppose the plan of those lodges to have been to demand a single payment from the members on entering, to provide 10s. per week in sickness up till the age of 70, the 100 members on entering the lodge in the Rural District would have had to pay down £1986, but the members in the City District would have been required to pay £2041—exceeding the other district by only £55, and at the end of 40 years the funds of both lodges would be exhausted. Next, let us suppose that the foundation of those lodges was on the general plan of the lodges in the Order, in which a sick allowance is guaranteed till the extreme of life; then their relative liabilities will appear in a new light. The lodge in the Rural District has become saddled with 52 members, while in the City District there are only 38 members; and without further evidence it will be obvious that the lodge in the Rural District is placed under the greatest liabilities. During the succeeding ten years, each member in the Rural District would experience about 21 weeks' sickness yearly, and as there are 52 members, the aggregate sickness would be 1092 weeks yearly. On the other hand, each member in the City District would experience 24 weeks' sickness yearly; but as the number of members is only 38, the aggregate sickness would amount to 912 weeks per annum, falling short of the amount of sickness experienced by the lodge in the Rural District by no less than 180 weeks yearly. It will thus be seen, that the very fact of the increased longevity of the members of the Rural Districts, chiefly accounts for the increased liabilities of the lodges in those districts. The advanced period of life is that in which the great amount of sickness is experienced, and in the City Districts the members are cut off before attaining it; but the prolongation of life in the Rural Districts places on the sick list of a lodge a great mass of members at an advanced age, when they become also permanent burdens on the funds.



The relative liabilities, so far as sickness is concerned, in the two districts, may be represented by the following money expressions, which are the equivalents in a single payment, for members entering at the same age, to provide equal allowances in sickness during the whole period of life:—

|                           |     |    |   |
|---------------------------|-----|----|---|
| Rural Districts . . . . . | £36 | 19 | 5 |
| City Districts . . . . .  | 30  | 15 | 8 |

So far, then, it is obvious that the scales No. 1 and No. 2, published by the Board of Directors, are not at all applicable to the classes for which they were intended; for if the facts of the case were admitted to have any weight, they would go to reverse the application of those scales, and that which was meant for the Town or Manufacturing Districts and Classes, would be applied with more truth to the Agricultural Districts and Classes.

On referring to the preceding Abstract, it will be seen that the annual payments for the four benefits combined, amount, in the—

|                              |    |    |    |
|------------------------------|----|----|----|
| Rural Districts to . . . . . | £2 | 0  | 5  |
| Town Districts . . . . .     | 1  | 19 | 8  |
| City Districts . . . . .     | 1  | 17 | 11 |

So that if those benefits were adopted by the Unity generally, or any other scale of benefits bearing the same relation, the contributions in the Rural Districts, if adjusted on equitable principles, should be the highest, and those in the large City Districts the lowest, the smaller Town Districts being intermediate. It becomes, however, a practical question of important consideration, whether our knowledge of the subject has yet become so refined, and whether the difference in the risks of the various classes has been proved to be so remarkable, as to render two scales of contribution necessary.

If the results for the three districts combined, as given in the preceding Table, be viewed in connection with those for each of the districts, it will immediately appear that the difference, although of the opposite character to that anticipated, is, after all, exceedingly small, and, in a practical sense, unimportant; as there is scarcely another feature in the management of the various lodges, which has not more influence on their monetary affairs. For the City Districts, the difference is 2s. 3d. yearly; for the Town Districts, the difference is 6d. yearly; and for the Rural Districts, the difference is 3d. yearly.

To recognise, therefore, a difference in various districts, while lodges are, as in the Unity, all under the same general constitution, is clearly a refinement at which the most improved institutions of the day have not yet arrived.

An inspection of the same Abstract will further prove, that if the regulations of the lodges in the Unity were such as to give a member the option of providing any one or more of the four benefits, the case would be immediately altered, and it would become, in that event, necessary to make a distinction in the payments. There is no doubt that even



this change, with many others of an important nature, will take place before many years pass away, and render the Order the great asylum of the working and industrious classes, to which they can, with confidence, resort for relief from the pecuniary distress and indigence which almost invariably attend sickness and disease.

It will not now be necessary to enter into the question of the influence of employment or occupation on the liabilities arising from the various classes of members, as it is evident that the increased mortality and sickness in peculiar trades place them relatively to the Unity in a similar position with that which the members of the City Districts were shewn to hold to those of the Rural Districts; and, therefore, the same arguments used in respect to the influence of locality on the liabilities of lodges, are equally applicable to the question of employment.

The preceding results, drawn from direct observation and calculation, shew that there is, in fact, no reason to make any distinction between the manufacturing and agricultural classes in the Unity; and hence, since it has been shewn that scale No. 1 is unsafe, and must bring ruin on the institution, the danger to be apprehended under scale No. 2 is still greater. There remains, however, another way by which to shew to members the remarkable uniformity which prevails among those results for various classes of the community, and the precision with which their various liabilities may be determined under a proper analysis of the subject; and for this purpose reference is made to Table A Z.

An inspection of the first column of that Table will shew, that in the various districts the expenditure on sickness bears a very striking and uniform relation to the amount of contributions; and, therefore, some very powerful influence must prevail, or so positive a determination of the results could not be produced. In the whole Unity, the expenditure on sickness is 43·702 per cent. of the income from contributions, and in none of the districts is the difference in this item so great as one-half per cent., or 1-87th of the whole. So uniform a result is well calculated to inspire confidence in those laws of sickness which represent the liabilities of benefit societies of every description. Again, in all the other columns of the same Table, a similar harmony will be found to prevail; but, as items of a fluctuating character enter into those columns, the results are somewhat disturbed, although not to any important degree. It will be seen that the relation of column 7th to 5th is expressed by the figures in column 2nd. It will likewise be seen, that the income from each member is least of all in the Rural Districts, somewhat higher in the Town Districts, and greatest of all in the City Districts; but then it will be further seen that the expenditure on sickness in each of these districts bears almost precisely the same relation to the respective incomes of those districts. An inspection of column 4th will, however, shew that in the Rural Districts, although the expenditure on sickness is in the same proportion as the other districts, still the ratio of the total expenditure to the total income is less than in the other districts; this, no doubt, arises from a difference in the mode of management, and admits of ready explanation.



The following will shew the total surplus or saving to each member of the Unity, for each of the Districts, during the year 1844:—

|                                                                 | Rural District.                | Town District.   | City District.                 | The Three Districts combined.   |
|-----------------------------------------------------------------|--------------------------------|------------------|--------------------------------|---------------------------------|
| Actual Saving to each Member . . . . .                          | £ s. d.<br>0 6 9 $\frac{3}{4}$ | £ s. d.<br>0 6 6 | £ s. d.<br>0 7 2 $\frac{1}{4}$ | £ s. d.<br>0 6 10 $\frac{1}{2}$ |
| Saving per Cent. on the Income for }<br>each Member . . . . . } | 27 per cent.                   | 26 per cent.     | 25 per cent.                   | 26 per cent.                    |

It will thus be seen that there does exist some general principle or law by which the relation of expenditure to income is regulated in the Order. A remarkable uniformity was shewn to prevail in the ratio of expenditure on sickness to the income from contributions ; the result in none of the districts differing by one-half per cent. from that for the whole Unity, so also will the relation of the total expenditure to the total income in the various districts be found to differ but little.

It is, therefore, obvious that, so far as the experience of the Unity goes, there is no reason to believe that the lodges in the Rural Districts are in a more favourable condition than those in the larger Towns and Manufacturing Districts. It is equally clear, from the facts and principles adduced elsewhere, that on the scheme on which the lodges of the Order are conducted, there is no reason for having two scales of contributions ; and that, before such innovations are introduced, other important changes, of a character not yet recognised in the Order, must take precedence. It consequently follows that all the objections brought against the adoption of Scale No. 1, come with redoubled force against the introduction of scale No. 2. The recent appeal made by the Board in favour of the general adoption of scale No. 1 is, therefore, to be strongly approved of ; and it is hoped that a strenuous effort will be made to induce the lodges to relinquish both scales, and determine on one better calculated to carry out successfully the high and beneficial purposes of the Order. The means of obtaining competent opinions on such subjects are ample ; and it should be the imperative duty of every member, but particularly of every officer of a lodge, and in an especial degree of every one of the directors, to institute a searching inquiry, and settle a question, the importance of which cannot be doubted, and the angry and unprofitable discussion of which now threatens so much danger to the Order.

One remarkable feature connected with the history of Odd Fellowship, is that of exacting a uniform rate of contribution from all members from 18 to 40 years of age. Almost every other friendly society of any pretensions has long relinquished any such plan. When the laws of sickness and mortality were but imperfectly understood, it was natural enough to expect no distinction to be made for difference of age ; but those days have



passed away, and no scientific fact is now better established than the influence of age on the amount of sickness and mortality. It is, therefore, surprising that an institution of the gigantic proportions of the Manchester Unity, should have remained to the present time, either quite ignorant of such a principle, or indifferent to its importance.

By consulting Tables V and X, the influence of age on the amount of sickness will become evident. In the decennial period of life from 20–30, the amount of sickness to each member is under 9 weeks, but in the period from 60–70 years of age the sickness equals above 77 weeks, and in the intermediate periods of life, like differences prevail. The injustice of admitting members at those extreme ages on equal terms is therefore obvious, but even within the ages recognised for admission by the Order striking differences will appear.

The results in the following Abstract are derived from the respective Tables in this Contribution.

| Yearly Payments required.                                                  | Age 20. | Age 30. | Age 40. |
|----------------------------------------------------------------------------|---------|---------|---------|
|                                                                            | £ s. d. | £ s. d. | £ s. d. |
| To secure 10s. per week in Sickness for whole life (see Table A R) . . . } | 1 3 6   | 1 12 0  | 2 6 9   |
| To provide £10 on the Death of a Member (see Table A M) . . . }            | 0 2 9   | 0 3 6   | 0 4 9   |
| For £5 at Death of Member's Wife (see explanation, page 498) . . . }       | 0 1 0   | 0 1 3   | 0 1 8   |
| Total payment for the above Three Benefits                                 | 1 7 3   | 1 16 9  | 2 13 2  |

From the above Abstract it will be seen that the payments necessary to provide for the above benefits at age 40, are nearly double those required at age 20; nothing could therefore be more absurd than to admit members entering at those ages on the same terms: and yet this is, in effect, done by the Order. It is true, that according to the 32nd General Law, members entering at ages under 35 pay entrance or initiation money of £1 1s., but those entering at age 43 pay £5 5s. Let us, therefore, determine to what extent those sums will affect the yearly contributions. On going back to Table A H it will be found that those entrance moneys are, at age 20, equivalent to an annual payment of—

|                     |             |
|---------------------|-------------|
|                     | £0 0s. 11d. |
| at age 30 . . . . . | 0 1 0       |
| at age 40 . . . . . | 0 6 0       |

Hence it will follow that the yearly payments by those entering at the given ages should be augmented by the above sums, which are equivalent to the initiation fees paid to them; and the following will shew the yearly sums thus actually paid by the various classes of members according to the proposed scale, and the sums which ought to be paid.



| Age at Entry.                  | Actually Paid. | Ought to be Paid. | Deficit. |
|--------------------------------|----------------|-------------------|----------|
|                                | £ s. d.        | £ s. d.           | £ s. d.  |
| Members entering at Age 20 . . | 1 2 7          | 1 7 3             | 0 4 8    |
| Ditto ditto 30 . .             | 1 2 8          | 1 16 9            | 0 14 1   |
| Ditto ditto 40 . .             | 1 7 8          | 2 13 2            | 1 5 6    |

The danger as well as the injustice of following such a practice must be obvious to the most casual observer. By young members joining the Order at age 20, there is an annual loss of 4s. 8d.; but by those entering at age 30, the yearly loss is increased to 14s. 1d.; and by those members entering about age 40, the loss per annum is as much as £1 5s. 6d.; so that in fact this last class of members pay little more than half the yearly sum necessary to meet the liabilities incurred by the lodges through their membership. The injustice thus done to those who enter at an early period of life, and the perilous position in which the whole Order must be placed by the admission of members of 30 years of age and upwards on the same terms, should call for immediate reform. The abuses of Odd Fellowship are of the most serious and alarming nature; and if not at once struck at the root and eradicated, they will soon become too formidable to admit of the possibility of applying any remedy.

Many attempts have lately been made to meet such arguments and facts as the preceding, by bringing forward the experience of particular lodges; but a very few observations will readily shew the impropriety of such a course. The experience of the Providence Lodge, Manchester, for the period of 13 years, has just been published, from which it appears that the sickness of each member varies in some years from 6 hours per annum to 10 days 2 hours, and the average for the whole period is 4 days and 6 hours to each member; but when it is stated that those fluctuating results are deduced from a society in which the number of members varied in the same period from 24 to 82, no surprise will be felt at such irregular results. To argue any principle or rule for the guidance of lodges in general, from so limited and meagre a body of evidence, would be as futile as to measure the value of life in the whole community from the results of mortality in an individual family. Many other instances can be furnished, illustrative of the wide discrepancies resulting from small numbers. For example, taking 8 different lodges, of ready reference from the October Quarterly Report of the Manchester Unity, in which there are in all 265 members, it is found that the average sickness to each, during the year 1844, was only 2 days and 13 hours; but taking 8 other lodges with 294 members, the average sickness was no less than 10 days and 18 hours. Such results are not at all extraordinary or unexpected. To the most limited observer it is well known that it is only an essential feature of the law of sickness. With small numbers no guarantee can be given for particular results; but as the number of persons over which the observations extend are increased, then a nearer approximation to the defined law will manifest itself. On



referring to a report of an interesting nature, although defective in some of its details, recently issued by the Blackburn Districts, it will be found that during the five years, 1841-1845, the number of members varied from 1510 to 2154; or more correctly, the average number of members exposed to the risk of sickness during that time was 1654, and the total amount of sickness was 7109 weeks, or 6 days and 3 hours to each member yearly. If disparity of age, and some other features connected with this report, were taken into account, a near approximation would be found to the rate of sickness as developed in the early part of this paper; but if the numbers observed were extended still further, and formed into large groups, such as those given in Table Y, then the results would produce a complete verification of the law of sickness.

These observations naturally lead to the recognition of another grand feature in the principles of these institutions, which might be well and effectively carried out within the Manchester Unity. Owing to the very small number of members in each lodge, it is impossible, even under the best and most skilfully graduated Tables, that the lodges could be safely and firmly established if existing independent of each other. The following analysis has been made of the number of members in the various lodges during 1844, according to the classification described at pages 19 and 421 *ante*.

| District.       | Lodges. | Average Number of Members. | Number of Members in each Lodge. |
|-----------------|---------|----------------------------|----------------------------------|
| Rural . . . . . | 1138    | 66,208                     | 58                               |
| Town . . . . .  | 1240    | 77,070                     | 62                               |
| City . . . . .  | 1304    | 99,747                     | 77                               |
| Whole Unity .   | 3682    | 243,126                    | 66                               |

It requires but little practical knowledge to understand that many such lodges, as above, would be destroyed from the operation of other causes than inadequate contributions. The average number of members appears to be about 66 to each lodge; and it is apparent that, if three or four unhealthy members were to gain admission to any one of these, it must soon break down, even with highly graduated terms; but where lodges number ten or a hundred times as many members, there is but little danger to be feared from such accidents. One of the most valuable features to be introduced into the Order would therefore be the formation, either of all the lodges into one grand parent society, or of a certain number into districts, with united interests. The practical details for carrying out such a plan are perfectly simple; and the advantages to arise so obvious, that it deserves the best consideration of members.

The reports of the Blackburn and Preston districts of the Manchester Unity sufficiently prove the great hazard and risk attending small lodges or societies, and how uncertain must be their stability, from the marked fluctuations to which small numbers



are always subject. In January 1848, the Blackburn district consisted of 28 lodges, and 2109 members, or about 75 to each lodge; and in the preceding year they experienced 15,507 days' sickness, being about 7 days 8 hours to each. However, in one lodge, consisting of 57 members, the sickness in that year did not average more than 17 hours to each; but in another, having 47 members, the sickness averaged upwards of 35 days to each member, or about 50 times more than the other lodge; and 6 only of the 28 lodges experienced anything like a near approximation to the average result.

Again: in another report made by the Blackburn District, in which the sickness and mortality for the five years 1841-5 is furnished, it appears that even the average for the whole five years, in the various lodges, differs widely, being as high as 10 days 16 hours in one, and only 2 days 6 hours in another, while the average for the whole five years, for all the lodges collectively, was 5 days 20 hours. It is hence obvious that, even over a series of years, considerable fluctuations take place in the rate of sickness among individual lodges.

In the report of the Preston District Sick Union of the 19th of April, 1850, this subject is treated with much judgment, and a Table is furnished of the experience of the lodges in that district for two years, of which the following is an Abstract:—

*The Average Amount of Sickness amongst the Members of the Preston Sick Union,  
Independent Order of Odd Fellows, M.U.*

| 1848-9.                      |                    |                             | 1849-50.           |                             |                             | Average for 2 years. |  |
|------------------------------|--------------------|-----------------------------|--------------------|-----------------------------|-----------------------------|----------------------|--|
| NAME OF LODGES.              | Number of Members. | Average amount of Sickness. | Number of Members. | Average amount of Sickness. | Average amount of Sickness. |                      |  |
|                              |                    | days. tenths.               |                    | days. tenths.               |                             | days. tenths.        |  |
| 1 Bee Hive . . . . .         | 140                | 3 9                         | 137                | 6 8                         |                             | 5 3                  |  |
| 2 Traveller's Home . . . .   | 73                 | 6 8                         | 68                 | 5 8                         |                             | 6 3                  |  |
| 3 Good Design . . . . .      | 140                | 8 1                         | 124                | 7 6                         |                             | 7 8                  |  |
| 4 Traveller's Rest . . . .   | 90                 | 5 6                         | 92                 | 7 9                         |                             | 6 7                  |  |
| 5 Evening Star . . . . .     | 75                 | 7 3                         | 71                 | 17 1                        |                             | 12 2                 |  |
| 6 Pleasant Retreat . . . .   | 175                | 3 8                         | 182                | 4 5                         |                             | 4 1                  |  |
| 7 England's Glory . . . .    | 97                 | 6 9                         | 86                 | 4 7                         |                             | 5 8                  |  |
| 8 Industrious Bee . . . .    | 52                 | 4 0                         | 55                 | 11 2                        |                             | 7 6                  |  |
| 9 Mother to the Distressed . | 44                 | 12 0                        | 40                 | 13 4                        |                             | 12 7                 |  |
| 10 Widow and Orphans . .     | 60                 | 9 7                         | 55                 | 9 0                         |                             | 9 3                  |  |
| 11 Rose in the Valley . . .  | 32                 | 16 1                        | 32                 | 12 1                        |                             | 14 1                 |  |
| 12 Poor man's Protection . . | 22                 | 3 3                         | 22                 | 14 2                        |                             | 8 7                  |  |
| 13 Windsor Castle . . . .    | 83                 | 8 7                         | 84                 | 7 7                         |                             | 8 2                  |  |
| 14 Philanthropic . . . . .   | 85                 | 4 7                         |                    | No Return.                  |                             |                      |  |
| 15 Morning Star . . . . .    | 55                 | 6 2                         | 57                 | 4 6                         |                             | 5 4                  |  |
| 16 No Danger . . . . .       | 70                 | 10 7                        | 60                 | 8 5                         |                             | 9 6                  |  |
| 17 Glorious Apollo . . . .   | 49                 | 2 4                         |                    | No Return.                  |                             |                      |  |
| 18 Prince Albert . . . . .   | 24                 | 2 4                         | 61                 | 1 7                         |                             | 2 0                  |  |
| 19 Farmer's Glory . . . .    | 40                 | 8 3                         | 45                 | 3 7                         |                             | 6 0                  |  |



Over the period of two years, to which the above observations extend, the average sickness was 7·3 days, while in one lodge the ratio was 2 days to each member, and in another as much as 14 days. It is possible that some of the differences in the above Abstract may be due partly to other causes than the fluctuation of small numbers, since six of the above lodges had in the year 1848-9 less than 50 members, and in the following year there were four lodges with less than that number. The experience, therefore, of the most careless observer, must have shewn him the insecurity of every society with so small numbers; and it is to be hoped that the example of the Preston Sick Union will be speedily followed by other districts of the Unity.

The report already alluded to by the Board of Management is so important, that no apology is needed for giving it at length.

*Report of the Board of Management of the Preston District Sick Union, Independent Order of Odd Fellows, M.U., presented to the Delegates assembled from each lodge in the Union, at the adjourned Special Meeting held at the house of Host Gerrard, the King's Arms Inn, on Wednesday Evening, the 10th of April, 1850.*

“The Board of Management, in presenting a Report of the operations of the Union during the two years of its existence, deems it expedient to enter a little into detail upon the causes which led to its formation, and the principles upon which it is based.

“The extensive organisation, the rapid growth, and the unquestionable importance which the numerous secret and benefit societies of this country had assumed a few years ago, very naturally attracted the attention of members of other classes in society, than those more immediately connected with them. The soundness of the financial position of many, and particularly of the Independent Order of Odd Fellows (the most extensive and important of these institutions), had been the subject of much discussion; and many various and conflicting opinions on the subject were advanced. The great utility of societies of this character, and the vast amount of advantages they were calculated to confer upon society in general, and the industrious classes especially, provided their financial regulations were based upon sound scientific deductions from correct data, was however pretty generally acknowledged. Mr. Neison, the eminent actuary, in his “Contributions to Vital Statistics,” published in 1845, acknowledges this, although he exposes many of the errors into which they had fallen, owing to the want of adequate scientific information. He says, (page 90,) ‘An immense number of societies were formed in a very short period, and their contributions regulated by the most delusive and inadequate data; so at the present time very few are to be found calculated to survive many years. Under a scientific and amply developed system, those societies would be calculated, at no distant period, to completely remove the cause of nearly all that poverty, distress, and misery which haunt our manufacturing towns, and fill our workhouses with the working classes of the country; but, owing to the imperfect and unstable foundation on which they are at present built, instead of being a help and support to a poor man, they involve him in those difficulties for which he might otherwise have provided. On becoming a member of such a society, he reasonably looks forward to it as a support for his declining years, and a protection during periods of sickness and disease; but ultimately, at the very time when assistance is required, he discovers that the society has been formed upon a *ruinous plan*, that the increasing years and infirmities of its members have absorbed all its funds, and that those surviving must be thrown



destitute on the parish as a public charity.' That these observations are unfortunately but too true, is proved by the statistical Tables tendered by Mr. Barlow, of Birmingham, in his evidence before the Select Committee of the House of Commons, on the Friendly Societies' Bill, last year; which Tables were formed from actual evidence taken from the experience of the workhouses of Birmingham, Alresford, and Winchester Unions. Mr. Neison afterwards says, at page 138 of the same work, 'It is evident that the Order of Odd Fellows stands in need of much improvement; and considering that 33 Members of Parliament, and between six and seven hundred of the clergy, as well as many other elevated names, are said to be enrolled as members, it is remarkable that some gentleman of influence and scientific attainments should not before this have given attention to the lamentable condition in which his too confiding brethren of the Order are placed, and have done something to raise the Unity to the common level, at least, of the friendly societies throughout the kingdom.' This is certainly very sweeping language; yet if, on the one hand, it be granted, owing to the insufficiency and incorrectness of the materials upon which Mr. Neison, at that time founded his calculations, that the portraits he draws of Odd Fellowship, its position and prospects, presents a rather more unfavourable likeness than the reality warrants, yet, on the other, it must be confessed that there existed but too many causes to justify the sombre hue which he threw over it. That our financial system was of a purely fortuitous character; that our rate of contribution was inadequate to the realisation of the benefits promised, was flagrantly apparent to those who were in possession of any knowledge on the subject. It was and still is a question of the highest importance to the interests of the members themselves, that their true position should be correctly ascertained, and clearly and honestly exhibited before them. The active exertions of some of the friends of the Order caused considerable improvement to be effected at the Glasgow Annual Moveable Committee. The spirit of inquiry, once awakened, rapidly advanced in the right direction; and the demand for correct information on the subject has resulted in the compilation of Tables founded upon the Order itself. After these Tables shall have been presented to the Unity at large, doubtless many further important improvements will be cheerfully introduced.

"Following side by side with these steps of progressive improvement, the Preston District Sick Union was established for the purpose of remedying another defect in our constitution, which was calculated to be productive of as much disastrous consequence as the insufficiency of the contribution itself. The defect alluded to is the now admitted statistical fact, that there can be no certainty of permanency in independent societies of small numbers, a large extent of basis being absolutely necessary to approximate to anything like a certain average of liability. Mr. Neison, in his evidence before the Select Committee of the House of Commons, last year, is very explicit on this point. He says, 'Societies must have numbers sufficiently large, also, to warrant any process of calculation being applied to their guidance. If the society were very limited in its numbers, the wisest calculations would be of little use, because they would be disturbed by great fluctuations. It is quite possible that a society of 50 or even 100 members, using Tables that are perfectly safe to the average of all friendly societies, might not provide half the contributions that are necessary for its own peculiar circumstances, or it might provide double the amount which is necessary.' Again he says that, 'a society consisting of 1000 members might be perfectly safe upon a Table calculated upon known data:' but he afterwards says, 'that 100 would not be safe under any calculation. The result would be matter of accident; there would be fluctuations, and these might be towards the maximum or minimum.' Again he says, after alluding to the subject in detail at some length, the 'effect in the long run would be to amalgamate the smaller societies, making them into societies of greater numbers, in order to attain an average.' Mr. Neison grants that 'a society of 300 members might approach to safety;' yet it is evident that he prefers a much wider basis than even that. Indeed the principle is, the wider the basis the greater the



certainty of an average; the only limit being that it shall not become so extensive as to interfere with its judicious and efficient management.

“Many other parties amongst the ablest and most intelligent of the advocates of our Order, and its great and benevolent objects, have recommended, and are still continually recommending to us, the adoption of this principle, in some form or other. In a very elaborate and very favourable article on the subject of friendly societies, and particularly Odd Fellowship, published in the supplement to the ‘Leeds Mercury,’ of the 22nd Jan., 1848, after defending the Order from several groundless charges which had been preferred against it, the causes are analysed which operate to produce the rapid accumulation of funds in some instances, and the absolute insolvency of lodges in others. The writer afterwards proceeds to say: ‘The remedy we would here respectfully suggest is simple and obvious, namely, the extensive union of the lodges of a district for the purpose of relieving the sick members out of one general fund—a practice already adopted by districts in the dispensation of funeral gifts, and which has been found to work very satisfactorily. By this simple expedient, the accidental burden which at present frequently involves single lodges in serious difficulties, would, by being spread over a large surface by means of a more extensive union of interests, be in a great measure averted; they would then cease to have a partial operation, and becoming amenable to the general law of life assurance, would be provided for without any difficulty out of the general funds of the society.’ Mr. Sanders, of Birmingham, too, in his evidence before the Committee of the House of Commons, in reply to the question, ‘What number (of members in a society) would you recommend?’ said, ‘I think the larger the better. I do not think your number can be too large,—a thousand or 10,000. We have 5000 in ours now.’ In a very able article, written in the kindest and most favourable spirit, and published in ‘Eliza Cook’s Journal,’ of the 16th of last month, after eulogising our objects, and giving us ample and full credit for the good that has resulted, and is still likely to result from such institutions, the writer, amongst other suggestions for our improvement, says: ‘The security and reliability of benefit societies would also be increased by a combination of their now separate and distinct lodge funds into a united fund. At present, lodges with a preponderance of old members are avoided by the young, and the consequence very often is, that the old lodge, from the heavy sickness of its more aged members, becomes unable to meet the claims upon it, and the box is closed or it breaks up. Were the members of the various societies combined together in one grand union, and the rates made sufficient, any such calamity as this could not occur.’ Although much of the evidence here produced has been published since the establishment of the ‘Preston District Sick Union,’ it was a conviction of the truth of the great principle therein enunciated, which led to its formation. Of course, like most other innovations upon ancient usages, the Union has met with some opposition, but by no means so much as might reasonably have been anticipated. The eminent actuary before quoted, says, ‘There is a very great difficulty is persuading societies to immediately reform; and I think it is not to be wondered at that it should be so, because it is a difficult question really to comprehend; nothing but the lapse of time, the force of public opinion, and the question being frequently agitated, will ultimately bring about that amount of reform in their condition which is necessary.’ The Board has every reason to congratulate the members of the various lodges on the progress which this most important question has already made in the public opinion.

“By the Table which accompanies this Report it will be clearly seen that our own practical experience for two years fully bears out the theory of the projectors and advocates of the union. The great uncertainty of liability in lodges of small number is exhibited so fully, that the most sceptical must immediately recognise the fact. Take the lodges numbered 12, 17, and 18, and then those numbered 9 and 11, the whole of which possess less than 50 members each. The minimum liability for the first year, is 4s. per member, and the maximum 20s. 1½d., above 500 per cent. of a variation!



Again, compare the first year of No. 12 with the second, and the result is a variation from 5s. 6d. each to 23s. 8½d., proving that the very lodge itself which appears so very healthy during one period, may be in a very short time placed in the very reverse position! The second year presents a variation of a still more alarming character, the lowest liability being 2s. 10d. each and the highest 25s. 6½d.! By referring to lodges Nos. 1, 3, and 6, the largest on the list, and numbering between 100 and 200 members each the great principle of the Union begins to develop itself, that the broader the basis, the more certain is the average; the highest rate per year being 13s. 5½d., and the lowest 5s. 9¼d. If we follow the operation of the broader basis to the whole extent of the Union, we arrive at the gratifying fact, that the variation almost entirely disappears, the difference in the average liability between each year being no more than eight pence! The average amount of liability of the whole district, too, and this is a highly important fact, approximates very nearly to the average of friendly societies in England and Wales. The Board is not yet in possession of sufficiently correct data respecting the ages of the whole of the members, to state the precise variation in this respect; but after another year's experience there is good reason to believe the difficulty will be removed.

"The Board alludes with regret to the circumstance, that two of the lodges which originally joined the compact thought proper to secede from it. It would perhaps be impossible to state with certainty what precise causes led to this result, but it is more than probable that to the difficulty to which Mr. Neison alludes it ought mainly to be attributed. Certain it is that it was not (in the opinion of the Board) through the discovery of sufficient reasons to confute the arguments in favour of the great principle on which the Union is based, nor from any unkind feeling between the members of the seceding lodges and those composing the rest of the Union.

"It is somewhat singular that there should have been much difficulty in rendering this principle clear to the perception of our brother Odd Fellows, particularly when it is taken into consideration that it has been recognised for some time by them with respect to the liabilities attending the mortality of the members. The Board feels confident that the facts here presented will have some weight with the more reflecting and intelligent of our brethren, and will stimulate them to further exertion in the holy cause of rendering our valuable and much cherished institution more permanent, and of more fully and efficiently practically developing the great principles upon which it is based. The Independent Odd Fellows will surely not lag behind the times in this age of discovery and progress, but will rather press forward in the van of the great intellectual army which is now so rapidly achieving the most glorious of conquests, the subjugation and ultimate extirpation of the great enemy of social, moral and physical progression, 'popular ignorance.' They will not, it is confidently asserted, imitate the example of the foolish bird in the desert, which, on the approach of danger, thrusts its head into the nearest bush, fondly believing that by blinding itself to the fact, the evil will cease to exist; but that they will rather, from the inmost chambers of their hearts, cheerfully echo back the dying words of the illustrious Goëthe, 'Let in more light;' that they will struggle more manfully and earnestly to prove that they are not undeserving of the high compliment lately paid to them\*, that they are among the most *élite* of the working classes of this country both morally and intellectually.

"Signed on behalf of the Board,

C. HARDWICK, PROV. G.M., CHAIRMAN.  
ROBT. RABY, PROV. G.M., VICE-CHAIRMAN,  
THOMAS BINGHAM, HON. SECRETARY."

\* See "Eliza Cook's Journal" of the 16th March last (1850).



There is likewise a most remarkable example of the danger attendant on the management of small societies, to be drawn from the Quarterly Report for October 1845, of the Manchester Unity. The following is a brief Abstract which I have made of some of the more striking and anomalous results, an attentive consideration of which must shew how very much subject to fluctuation is the mortality, when viewed in connection with small numbers.

|                                  |                              | DISTRICT.                    | Number of<br>Lodges. | Number of<br>Members. | Deaths. | Rate of<br>Mortality being<br>one in |
|----------------------------------|------------------------------|------------------------------|----------------------|-----------------------|---------|--------------------------------------|
| Towns of which the Population is | under 5,000                  | Bourne . . . . .             | 18                   | 1116                  | 10      | 112                                  |
|                                  |                              | Bramley . . . . .            | 12                   | 1063                  | 13      | 81                                   |
|                                  |                              | Bollington . . . . .         | 2                    | 154                   | 40      | 3.8                                  |
|                                  |                              | Chepstow . . . . .           | 3                    | 109                   | 9       | 12                                   |
|                                  |                              | Edmonscote . . . . .         | 23                   | 1270                  | 11      | 115                                  |
|                                  |                              | Great Driffield . . . . .    | 10                   | 753                   | 1       | 753                                  |
|                                  |                              | Horseforth . . . . .         | 5                    | 469                   | 6       | 78                                   |
|                                  |                              | Knaresboro' . . . . .        | 11                   | 933                   | 10      | 93                                   |
|                                  |                              | Leominster . . . . .         | 13                   | 712                   | 0       | ...                                  |
|                                  |                              | Middleton and Hywd . . . . . | 13                   | 1466                  | 16      | 91                                   |
|                                  |                              | Mottram . . . . .            | 7                    | 687                   | 7       | 98                                   |
|                                  |                              | Pottery . . . . .            | 23                   | 2162                  | 26      | 83                                   |
|                                  |                              | Ruthin . . . . .             | 11                   | 484                   | 7       | 69                                   |
|                                  |                              | St. Helen's . . . . .        | 20                   | 1056                  | 12      | 88                                   |
|                                  |                              | Jedburgh . . . . .           | 4                    | 534                   | 7       | 78                                   |
|                                  |                              | Staleybridge . . . . .       | 8                    | 645                   | 15      | 43                                   |
|                                  |                              | Thirsk . . . . .             | 5                    | 292                   | 5       | 58                                   |
|                                  |                              | Thorne . . . . .             | 1                    | 47                    | 2       | 24                                   |
|                                  |                              | Wigton . . . . .             | 6                    | 312                   | 5       | 62                                   |
|                                  | 5,000<br>and under 30,000.   | Bedford . . . . .            | 23                   | 1341                  | 4       | 335                                  |
|                                  |                              | Bury St. Edmunds . . . . .   | 22                   | 1110                  | 3       | 370                                  |
|                                  |                              | Carmarthen . . . . .         | 24                   | 965                   | 15      | 64                                   |
|                                  |                              | Carnarvon . . . . .          | 11                   | 347                   | 8       | 43                                   |
|                                  |                              | Chester . . . . .            | 7                    | 454                   | 13      | 35                                   |
|                                  |                              | Gloucester . . . . .         | 10                   | 471                   | 12      | 39                                   |
|                                  |                              | Rotherham . . . . .          | 13                   | 946                   | 3       | 315                                  |
|                                  |                              | Southampton . . . . .        | 9                    | 708                   | 3       | 236                                  |
|                                  | 30,000<br>and under 100,000. | Bath . . . . .               | 20                   | 1275                  | 4       | 319                                  |
|                                  |                              | Bolton . . . . .             | 29                   | 3209                  | 19      | 179                                  |
|                                  |                              | Bradford . . . . .           | 30                   | 3409                  | 31      | 109                                  |
|                                  |                              | Dudley . . . . .             | 37                   | 1754                  | 14      | 125                                  |
|                                  |                              | Nottingham . . . . .         | 32                   | 2609                  | 19      | 137                                  |
|                                  |                              | Preston . . . . .            | 24                   | 2103                  | 16      | 131                                  |
|                                  |                              | Rochdale . . . . .           | 33                   | 3046                  | 0       | ...                                  |
|                                  |                              | Sheffield . . . . .          | 29                   | 2372                  | 22      | 108                                  |
|                                  | 100,000<br>and upwards.      | Birmingham . . . . .         | 91                   | 6061                  | 53      | 114                                  |
| Bristol . . . . .                |                              | 50                           | 2318                 | 25                    | 133     |                                      |
| Edinburgh . . . . .              |                              | 20                           | 2565                 | 13                    | 197     |                                      |
| London . . . . .                 |                              | 129                          | 9381                 | 51                    | 145     |                                      |
| Stepney . . . . .                |                              | 20                           | 1285                 | 8                     | 160     |                                      |
| Salford . . . . .                |                              | 24                           | 3065                 | 24                    | 128     |                                      |



It is to be borne in mind that the preceding figures relate to whole districts, embracing each on an average 22 lodges; and if the fluctuation be so very remarkable in relation to the combined results of whole districts, how great must be the danger in which individual lodges, having to meet their own liabilities, are placed! There is, perhaps, no improvement of which the Manchester Unity stands in more need, than the distribution, in whole or in part, of the fluctuations to which lodges are subject over districts sufficiently large to guarantee average results.

One point of importance in the management of lodges, is the proper investment of their funds. The preceding calculations and premiums would be inadequate to carry out the purposes intended, unless 3 per cent. compound interest, at least, be realised on the surplus funds, without any deductions for expenses of management. A single illustration will be sufficient to illustrate the great accumulations expected to arise from such mode of investment. Take the case of a young man entering a lodge at age 30:—he will have an equal chance of living 39 years; or in other words, of 100 members entered at that age, one half of them would live to attain 69 years of age, and during that period each would experience 115 weeks of sickness. Presuming that the funds were not invested at interest, each would be required to pay down £115 to enable the society to pay £1 per week during sickness; but on referring to Table AS it will be found that £68 14s. 6d. is all that is required to enable the society to meet its liabilities, provided the funds are improved at 3 per cent. compound interest. Again: if the question of mortality be considered, proof of the same advantages will be found. It is evident that, if money made no interest, according to Table AL, each member, on entering, would need to pay down £100 in order to provide £100 at death; but because, in calculating the same table, monies are assumed to improve at 3 per cent. compound interest, £37 8s. 4d. only is required.

In connection with the preceding remarks relative to sickness, it may be stated that in a recent number of one of the periodicals connected with the Order, a letter appeared setting forth a statement, that about 32 weeks was the amount of sickness required to terminate life in country as well as town; and from this starting-point a number of strange deductions and most fallacious conclusions were drawn, with a view of shewing that the proposed scale, No. 2, would be adequate, with good management, for a town lodge. It is surprising that this statement should have passed muster, and that the fallacy escaped the detection of the talented editor. It was only necessary to refer to the last October Report, issued by the Board of Directors, for a refutation of so dangerous a fallacy. It will be there found, as given in Table Y of this Contribution, that during 1844 there were 2286 deaths of members, and 226,917 weeks' sickness. From these two results it is therefore obvious, that during that year there was no less than 99 weeks' sickness to each death, or more than three times that stated by the writer in question. If the foundation of his argument be so much at fault, it is equally evident that his



recommendation relative to the adoption of scale No. 2 merits little confidence. The fact that there are more than 32 weeks' sickness to each death, can be proved by the results given at page 450 of this Contribution, in which that particular question has been investigated for the mortality and sickness at each term of life. At age 30 it will be found that there is about 116 weeks' sickness to each death. This differs from the results in the whole Unity, but the difference admits of a simple explanation, for on referring to pp. 421 and 493 of this volume, it will be found that the value of life in the Order is not quite so great as in the other friendly societies, and hence the somewhat shorter duration of life in the Order exposes the members to a less amount of sickness. The method, however, of taking a general average of sickness to the deaths, without regard to age, will be found subject to another error; for it will be seen that while at the period of life 31-35 there are 116 weeks' sickness to each death, at the term of 60-70 there are no less than 252 weeks to every death. An extension of this argument may be found useful in the management of the Order, for as the ages of the members increase, so also will the ratio of sickness increase in a higher ratio than the deaths; and although at the present time there are nearly 100 weeks of sickness for one death, in a few years, when the ages increase, it may happen that there will be 150 weeks' sickness for every death. On referring to the results given in Tables E and L, pp. 27 and 77, it will be found that, taking the population of friendly societies in England and Wales, as actually distributed, there are 157 weeks' sickness to each death, and in Scotland 145 weeks. These results differ slightly from each other, because there is a variation in the distribution of the two populations over the various periods of life. In the former, the greater number of old members has a tendency to increase the average amount of sickness. An extension of those arguments and figures has shewn in Table A G that of the male population of England and Wales above 10 years of age, 261182, or 4.5257 per cent., are constantly sick.

It has been often said, that the deficiencies in the rates of contribution will be amply compensated by the donations to the society, and the number of members who never seek relief from it. The latter part of the argument clearly falls to the ground, as the actual amount of relief given is quite equal to that anticipated by the Tables; and as to the benefits to be derived from donations, which some have represented erroneously at 20 per cent. of the whole income, it will be found that the amount from all sundry items not only does not help the contributions of the Order, but is inadequate to meet the expenses of management, being only 42 per cent. of that amount. It is, therefore, imperative on the Order, so far as donations are concerned, to graduate their rates on a scale equivalent at least to that given in the Tables already referred to.

Another argument frequently brought forward in favour of low rates, is the relief which the funds of lodges will experience by allowing only a reduced rate of aliment in long continued sickness. This argument can only be viewed as a desperate expedient to prop up a falling institution, and not calculated to afford any adequate support. The



first question which would naturally arise in an intelligent mind, is the practicability of applying such a principle to life contingencies, and the possibility of calculating the average duration of each attack of sickness at various ages. Unless the solution of this last question be first accomplished, it is evidently nothing short of quackery to proceed by random in the management of a society or lodge, under the blind belief that a reduction of aliment in long continued sickness will produce the great benefits to the funds which has been so often argued. No writer on Vital Statistics has yet solved the problem, and therefore means are not at present available to aid or warrant any one in stating the particular amount of relief which would be afforded by the introduction of such regulations. From the data and facts, however, given in Tables N N, O O, P P, and Q Q, enough is known of the subject to satisfy any diligent inquirer, that practically the funds of a lodge would be but little influenced by any such circumstances, except at very advanced periods of life, at which it will be presently shewn that a much better remedy or cure is available on scientific and understood principles, and that there is no need therefore of having recourse to expedients of a doubtful nature. It may, however, be here mentioned, that although much information has been given in the preceding on the question of the duration of each attack of sickness, still in anything like a complete form it is now for the first time, under investigation, with a view to publication, but in the meantime, and at this stage of the question, inspection of the second and fourth columns of the Table R R, page 450 of this Contribution will satisfy any one of the little practical advantage to result to a lodge or society by the adoption of such a regulation, while it must occasionally be attended with most serious injury to individual members. As formerly remarked, the great and essential and noblest feature in friendly societies of every description, is the certainty that under a skilfully developed system they will afford to members a competent support and complete independence, during sickness and disease. Admitting this integral element to have its full weight, and keeping in view the fact that in the Order itself the average full allowance in sickness is a little under 10s. per week, it becomes a serious question, whether the great principle of such an institution is not violated by admitting the existence of a regulation, which in the prime of life may reduce the support of an industrious workman, with possibly a large family, to the miserable pittance of 5s. weekly. It is evident that this would constitute pauperism itself. To these observations it may be replied, that the very fact of the principle affording but little relief to the funds, goes to shew that but few of the evils here detailed would occur. This, no doubt, is perfectly true; still individual cases must occasionally arise, and no society or lodge can be justified in admitting a principle which can possibly subject any one of its members to so hard a fate.

It is obvious that, if it be necessary to reduce allowances in long-continued sickness, such reduction will most effectively aid the funds in the advanced term of life; and fol-



lowing out this idea, it will be found that another principle is available, which is free from the objections of the preceding scheme, and at the same time fraught with most important monetary advantages to the members individually and collectively.

In an advanced period of life, say after age 70, it will always be a more difficult matter to define sickness than during an earlier period; and in the management of all benefit institutions which have existed long enough, this has been found a most serious practical difficulty, and so much felt, that up to the appearance of the present calculations no sickness Tables went beyond that term of life. Carrying out this view, it will be found, that by relinquishing sick allowances after 70 years of age, or any other term of life that may be fixed on, the practical management of lodges will become much simplified, their constitution strengthened and rendered more secure, and the moral character of the members exposed to less temptation.

The first part of the question to which we shall direct attention is that by which it will be seen that, under the plan of discontinuing the sick allowance at age 70, and substituting a deferred annuity at that age of one-half the amount of the weekly sickness allowance, the contributions from members would be very nearly the same as those which would be required to provide for a sick allowance to the extreme of life. In this instance we shall take the case of a member entering a lodge at age 32, the average age of the members in the Unity; and we shall further suppose that all his contributions will close after attaining age 70, and determine the yearly payment required under both conditions.

In the first place, to provide for the various benefits, including a sickness allowance to continue during the *whole period* of life:—

|                                         |   |   |   |   |   |   |    |    |    |
|-----------------------------------------|---|---|---|---|---|---|----|----|----|
| Payment for 10s. weekly sick allowance* | . | . | . | . | . | = | £1 | 16 | 6  |
| £10 at the death of a member            | . | . | . | . | . | = | 0  | 3  | 11 |
| £5 at the death of a member's wife      | . | . | . | . | . | = | 0  | 1  | 5  |
| Total yearly payment                    | . | . | . | . | . | = | £2 | 1  | 10 |

In the next place, to provide for the same benefits, but including a sickness allowance up to age 70 only, and after that period a deferred annuity:—

|                                        |   |   |   |   |   |   |    |    |    |
|----------------------------------------|---|---|---|---|---|---|----|----|----|
| Payment for 10s. weekly sick allowance | . | . | . | . | . | = | £1 | 1  | 9  |
| £10 at the death of a member           | . | . | . | . | . | = | 0  | 3  | 11 |
| £5 at the death of a member's wife     | . | . | . | . | . | = | 0  | 1  | 5  |
| Annuity of 5s. weekly after age 70     | . | . | . | . | . | = | 0  | 16 | 0  |
| Total yearly payment                   | . | . | . | . | . | = | £2 | 3  | 1  |

\* See Table A S, p. 480, col. 6.



It will thus be found that while, by the former method the yearly payment would be £2 1s. 10d., by the latter plan it would be increased only 1s. 3d. yearly, but the latter would possess advantages of a very high order over the other.

First, it would exercise a salutary check on imposition and fraud. There can be no doubt that numbers often enter lodges having concealed ailments, and defects of health and constitution not easily detected; and in every such case, were it a condition or regulation of the lodge that a member providing a sickness allowance must also contribute for a deferred annuity of at least one-half the amount, a protection would be formed against the undue expenditure of the funds. For if his health be so defective as to cause him to make unusual claims on the sickness fund, that very same feature would render his life of shorter duration, and consequently give him an inferior chance of becoming an annuitant; and the loss on the one fund would be, therefore, compensated by the gain on the other.

In the second place—a gigantic institution like the Manchester Unity would reap an advantage by being thus enabled to adopt a uniform scale for all districts; for, as may have been observed in a preceding illustration, if, in the City and Town Districts, an increased amount be paid in the shape of sick allowance, it must follow that fewer claimants will arise for annuities; so that if one well developed scale were provided, it would be equally applicable to all districts. In the next place, a universality would be given to the sphere of action of the Unity, by the freedom with which the members of various trades and occupations might be admitted into the lodges. There would not then exist the same necessity for that stringent exclusion of persons of particular callings, usually thought unhealthy, as the liabilities of lodges from sickness, and from annuities, would have a constant corrective influence on each other.

The merits of this plan over that at present in force seem to be quite apparent. It will enable the lodges to determine their liabilities with more precision, and very much simplify and improve the system of management; while the members will be removed from those temptations to fraud and imposition, in the advanced periods of life, which so easily connect themselves with benefit and provident societies. On attaining 65 or 70 years of age, or any other period at which it may be agreed the annuity should commence, the member will regard it as a permanent and standing allowance; and no scheming, or pretence of sickness, can have any tendency to increase that amount; those temptations being absent, there is every reason to believe that the relative position of all parties to each other would be improved, and a higher tone of moral feeling induced, as well as a more elevated social rank in society.

According to the present scheme of the Unity, members living beyond the age of 70 have still to continue their contributions or payments as before; but the preceding plan would relieve them from that burden. Again, the human constitution, as a general rule, is then still capable of sustaining considerable labour; the annuity is equivalent to the payment of 26 weeks yearly, of full pay in sickness; but during the succeeding ten years,



the sickness will average about 20 weeks yearly, and the remaining portion of the year will therefore be open to any avocations a member may be able or choose to follow, uncontrolled by the society or the surveillance of its officers. It may not be out of place to allude here to the duty which devolves on the officers of the Order, as the organs of a great public body, to endeavour to elevate the character and improve the circumstances of its members generally. Men, if they provide for their immediate wants, are very apt to overlook every provision for the winter of life; and it is no mean expression of the prudential feelings of the working classes of this country, to find above one quarter of a million enlisted in the ranks of one great mutual-supporting institution. It is said that not more than 130,000 members of the upper and middle classes have yet availed themselves of the benefits of life assurance. What a brilliant contrast do we then find on the part of the poorer classes of the country, in the host of persons enrolled as members of one description or another of friendly societies! The officers of the Manchester Unity ought to feel themselves under high and weighty responsibilities; they are called upon to take up a grand scheme of financial reform, and to propound it in clear and calm language to the members of the Order. The whole plan of the benefits and contributions should be remodelled, on the ground of the necessity for such a step in order to secure the stability of the Unity, and the manifest advantages thence to arise to its members and their families. If the habit of discussing and of practically providing for deferred annuities were once established, the most beneficial results would follow, and those engrafted on the succeeding generation might raise the Order into one of the noblest institutions of the times.

Recently it has been attempted to puff up the merits of the Order, on its charitable features and constitution. This is a species of advocacy in which the more enlightened and recognised supporters of Odd Fellowship should cautiously avoid participating. It ought never to be lost sight of, that thousands of members hold vested rights and interests in the Unity, and that these should be satisfied before other claims can legitimately arise. "Be just before you are generous" is perhaps the best reply to such enthusiasts. The merchant or tradesman who squanders his property on charities and other purposes, however laudable in themselves, would meet with but little sympathy should he do so at the expense of his creditors. So also with the Unity: young men in the vigour of health are induced to become members, and in a few years afterwards discover that they have been entrapped into a bankrupt society, which attempts to justify its fallen condition by the liberality of its charities. With what warmth and sincerity of feeling can those persons regard such a species of management? The great question of questions is the stability of the Order; and if the essential elements of security are wanting, not only will its charities disappear, but the Unity itself, with all its boasted blessings, be forgotten with other bubbles and visionary schemes. Let the terms of membership be such as will effectually carry out all the purposes contemplated; let every member of the Unity feel warranted in stating to his friend and neighbour—"In this society is exercised the highest order of



prudential feelings; every care has been taken to justify me in asserting, that whatever is promised to our members can with certainty be fulfilled. Join us at once: our weekly or monthly payments are small, but their accumulations will afford you in after years, and during periods of sickness and distress, a comfortable support, which you can demand as the just and merited reward of your own honest and industrious savings. It is the simplest and cheapest way of guarding against the calamities of sickness and disease, and affords the only available means to a working man of providing for the vicissitudes and infirmities of old age." If every member could at the present time, in honesty and good faith so express himself,—for the hundreds that now join the Order, thousands would become members, and the Unity outgrow in magnitude the most sanguine expectations of its advocates. Charity truly "covereth a multitude of sins;" but it is much to be feared that, unless immediate measures be taken to retrieve the lavish expenditure of the Order, its too much boasted charities will, by all right-thinking men, be classed among its follies and its extravagancies.

One of the most efficient means of awakening attention to the perilous condition of the Order, would be the periodical publication of well digested records of the experience of the various lodges, from the most remote periods of which their books would admit; and a proper and skilful analysis of those, extensively circulated, could not fail to give birth to much useful conversation and debate, ultimately resulting in important and highly beneficial reforms. Science would also be greatly aided by the facts and testimony of such records, and the literature of the Order acquire an importance in the community not otherwise easily attainable. The expense to each lodge of contributing its experience would be very trifling, while the advantages to the Unity would be immense.

These remarks were written in 1845; but, from what has been stated at the beginning and in subsequent portions of this Contribution, it will be seen that the course pointed out has been strictly followed; and it is earnestly hoped that every district in the Unity will now seriously discuss the subject, and avail themselves of the information drawn from the experience of the Order. The bulk of these remarks was written about ten years ago: they have been tried by the severe test of the practical working of the lodges in the Manchester Unity itself; and it must be obvious that the suggestions originally offered for the consideration of Odd Fellows, are at the present time equally applicable to the state and condition of the Order. And although individual districts have effected considerable improvements, the greater number of them stand in as much need of redress as ever. The recent Act, the 13th and 14th Vict., cap. 115, carried through Parliament by the benevolent and public-spirited efforts of Mr. Sotheron, Member for North Wiltshire, has placed Odd Fellow societies in a much better position than formerly; and it is hoped that the legal protection now granted to them by the legislature, will also have the effect of calling attention to their financial condition, with a view of placing their monetary affairs on a stable foundation, so as to justify the friends of provident institutions in recom-



mending Odd Fellow lodges to the approval of the public. There can be no doubt that there are very few lodges in the kingdom, at present, in so hopeless a condition that, under proper guidance and advice, they might not right themselves, and yet become strong and powerful. Still, the financial condition of many is most desperate; and nothing short of immediate and strenuous efforts will suffice to place them on a safe foundation. Delay will therefore be dangerous to most, and certainly fatal to many. Let every lodge, therefore, or, if possible, each district, hold immediate meetings, to consider what effect the recent information promulgated by the Order will have on their financial condition. A patient examination of it cannot fail to convince every one of the necessity and urgent reasons of reform; and such changes should not be effected loosely, but be carried out under the advice of competent authorities accustomed to consider such questions, and devoting their attention to the practical management of benefit societies. The Odd Fellow lodges and districts which have recently made efforts to place themselves on a sound and stable foundation, have experienced no serious difficulties in doing so; and there is no reason to think that the generality of other lodges and districts would find any greater obstacles in the way of improvement.

One course, at the present juncture, is clear, and open to every member. It must appear to be his bounden duty to raise his voice against the admission of new members on any other terms than those which science and experience prove to be safe and equitable. To do otherwise, can be described in its mildest form as nothing short of a fraud on the public. It is a great, and to some extent a difficult question, to remedy the evils incidental to the Order, so far as existing members are concerned; but as to future members there cannot possibly be any doubt or difficulty. There are numerous authorities in the country calculated to give sound and trustworthy advice on the course to be followed; and why should not these be consulted at a time when the most serious alarms are sounded in every quarter? Members should calmly reflect, that the radical and scientific part of the question is neither a very simple nor a very generally understood one, even among the most highly educated classes; and it can therefore be no reflection on the intelligence of any individual member to seek for advice elsewhere.

It is quite impossible to govern the Order on sound principles under the present mode of payments. The risks incurred under different classes of members have been shewn to vary, and the difference of age at admission proved to have a great influence over the magnitude of the risks. The truth of no fact has been better established. It is therefore only just that members should pay in proportion to the risks they impose on the lodges; and under the present uniform amount of periodical contributions by members of all ages, this is rendered impossible. For if a member at age 20 be required to pay £2 7s. (see Table A S) for an allowance of £1 per week during sickness, one entering at age 40 ought to pay £4 13s. 6d. yearly; but suppose he were admitted on the same annual payment as the other, in order to compensate for the loss which the old age



would thus sustain, an entry-money or fine of no less than £41 12s. 9d. would be required; or if the allowance in sickness were only 10s. per week, one half that amount of entry-money. It is needless to remark, that it would be quite impracticable to get workmen generally to pay such sums; at younger ages the entry-money would be less, but still too high and practically exclusive. At 30 years of age the entry-money for £1 per week in sickness would be £17 8s., and for 10s. per week £8 14s.

This will be enough to expose the folly of proposing to admit members of all ages on a uniform scale of payments. No other course is open but to have rates graduated according to age. There may still, from other considerations, be an entry-money of a small amount enforced, but not sufficient to make up for the differences of age. The above illustrations apply only to the sick allowance; but if the provision or assurance at death had also entered into the question, the entry-money would have been higher, and the difficulty increased. Arrangements might also be easily made to admit of every member paying according to his means, and receiving proportionate benefits, and thus embrace every class of the community.

It is evident that the Order of Odd Fellows stands in need of much improvement; and considering that thirty-three Members of Parliament, and between six and seven hundred of the clergy, as well as many other persons of elevated rank, are said to be enrolled as members, it is remarkable that some gentleman of influence and scientific attainments should not, before this, have given attention to this lamentable condition in which his too confiding brethren of the Order are placed, and have done something to raise the Unity to the common level, at least, of the friendly societies throughout the kingdom.

It is hoped that, while the preceding observations will satisfy the members of the Manchester Unity of the great need of immediate reform, and in some degree assist in establishing their institution on a secure foundation, other friendly societies may also derive from them useful suggestions for their future guidance.

There is another class of societies which attempts to carry out the general principles of friendly societies; but they are like the Odd-Fellow Societies, modelled after the very rudest shape in which benefit clubs were formed fifty years ago: and so far as relates to their contributions and benefits, scarcely anything further is necessary to be stated. "Rechabite" is the name by which those societies are known; and every member has to come under an obligation to abstain from intoxicating liquors, and to discountenance, by every lawful means in his power, the drinking usages of society.

The terms on which members are admitted are according to the following scale:—entry money at age 16 is 5s., and at age 40 it increases to £2 10s.; the monthly contribution, for all ages, is 1s. 4d., or 17s. 4d. annually. The benefits promised are an allowance of 10s. per week in sickness, and a deferred annuity of 5s. weekly after 70 years of age. To young members entering the Rechabite societies, or tents, as they are termed, at the age of 16, the actual premium for the above benefits, making allowance for entry



money, should be £1 2s. annually; at age 40, also allowing for entry money, the annual premium should be £2 10s. 2d.

It will thus be seen, that, by the youngest member at sixteen, there is an ultimate loss of 4s. 8d. annually, and by the member aged 40 there is a loss of £1 12s. 10d. annually, provided that it were possible to sustain such losses; but it is needless to add, that permanence is not to be expected with societies so constituted. Not only do the Rechabite societies, in common with Odd-Fellow societies, perpetrate an injustice on the younger members by the above disparity in the payments; but that injustice is further augmented by levying a uniform tax of 3s. yearly, without distinction of age, for funeral money, the sum of £10 being payable on the death of each member. The discouragement given to drinking usages, and the practice of temperance enjoined by Rechabites, is deserving of every support, and is well calculated to increase the comforts and elevate the moral and political condition of the working classes; and it is the more to be regretted that the monetary foundation on which the societies are built should be destined to effect their overthrow at so early a period.

A class of societies, of which there are about two thousand in the kingdom, pass under the name of Courts of Foresters, and to the ratio of sickness experienced by them attention was directed in page 465 *ante*, their object to provide against the calamities and vicissitudes of sickness and death; members are admitted between the ages of 18 and 38, on the same terms, and participate, to the same extent, in the benefits offered. It is therefore unnecessary to add anything to what has already been remarked of Odd-Fellow and Rechabite societies, as the same observations are equally applicable to all.

The illustrations of the condition of the various grades of friendly societies, given in the preceding pages, have been made as general as possible, in order to insure their being readily understood by the members, to whom they were more particularly addressed. It will be necessary, in every instance where any practical application is made of the facts presented, to use every caution in the selection of those examples which strictly belong to the case in point; and it is hoped that the marked differences which have been shewn to prevail between the rates of mortality and sickness, under the many modifications as to condition and peculiarity of employment and rank in society, will be a sufficient guarantee against the indiscriminate use of the general results for the government of individual classes, whose circumstances differ widely.

Should these Contributions in any degree advance the science of Vital Statistics, and place the provident and self-supporting institutions of the people on a more permanent foundation, the highest wish of the writer, in venturing on so important a subject, will be consummated.

---



## AUXILIARY TABLES OF RATES AND CONTRIBUTIONS.

---

The monetary Tables given in pp. 470-81 *ante*, have an extensive application, and will be found to be exceedingly useful, but that the large body of data contained in these Contributions may be still more generally applied to all classes of provident institutions the following auxiliary Tables are given.

In pp. 205-17 *ante*, formula and examples were given for the construction of mortality Tables, and, in pp. 148-9 and 494-6, were also given formula and examples of the construction of auxiliary Tables, but these were by the direct and not the continuous mode of calculation. The determination of the figures in the D column of the preceding Tables was accomplished by an independent calculation for each result, and was not affected by those for other ages, but in the construction of the next ten Tables a continuous calculation, by the method of series, has been preferred, and the formula employed will be found in the next page. One great advantage to be derived from this method is that, if an error should enter into any step of the calculation throughout the Table, it will affect the whole of the subsequent results, and as a few minutes will suffice to perform the direct calculation for any given age by the method given in pp. 148-9 *ante*, the agreement or difference between the results of the two methods will shew whether the whole Table, by the continuous method now followed has been properly constructed or otherwise.

The explanations, formulæ, and examples furnished in pp. 544-50, in respect to the construction of auxiliary Tables on joint lives, may be usefully studied in connection with the illustrations given in the two following pages. There is also a very interesting and curious example of the practical application of the continuous method of calculation given in one of my Reports on the Bengal Military Fund, namely, that dated the 13th November, 1854.



The following formula have been employed in the formation of Tables **1** to **11** inclusive, and also with the necessary modifications in the construction of the subsequent auxiliary Table on joint lives:—

$$\begin{aligned} D_x &= l_x v^x \\ \lambda.D_x &= \lambda.l_x + \lambda.v^x \\ \Delta\lambda.D_x &= \lambda.p_x + \lambda.v = \lambda.v p_x, \text{ the values of which, at seven per} \\ &\text{cent., will be found tabulated in} \\ &\text{Table } \mathbf{12}, \text{ column 7.} \end{aligned}$$

$$\begin{aligned} \lambda.D_{x+1} &= \lambda.D_x + \Delta\lambda.D_x, \text{ and} \\ N_x &= \Sigma D_{x+1}, \text{ also in} \end{aligned}$$

|                |     |                  |                         |       |
|----------------|-----|------------------|-------------------------|-------|
| Table <b>2</b> | $v$ | $= (1.03)^{-1}$  | $\lambda.v = 9.9871627$ | 75295 |
| <b>3</b>       | $v$ | $= (1.035)^{-1}$ | $\lambda.v = 9.9850596$ | 50207 |
| <b>4</b>       | $v$ | $= (1.04)^{-1}$  | $\lambda.v = 9.9829666$ | 60701 |
| <b>5</b>       | $v$ | $= (1.045)^{-1}$ | $\lambda.v = 9.9808837$ | 09553 |
| <b>6</b>       | $v$ | $= (1.05)^{-1}$  | $\lambda.v = 9.9788107$ | 00930 |
| <b>7</b>       | $v$ | $= (1.06)^{-1}$  | $\lambda.v = 9.9746941$ | 34735 |
| <b>8</b>       | $v$ | $= (1.07)^{-1}$  | $\lambda.v = 9.9706162$ | 22315 |
| <b>9</b>       | $v$ | $= (1.08)^{-1}$  | $\lambda.v = 9.9665762$ | 44513 |
| <b>10</b>      | $v$ | $= (1.09)^{-1}$  | $\lambda.v = 9.9625735$ | 02059 |
| <b>11</b>      | $v$ | $= (1.10)^{-1}$  | $\lambda.v = 9.9586073$ | 14842 |

$l_x$  = Number living at the age  $x$  in the second column of Table C (Males), pp. 5-6 *ante*.

Also  $v^x$  = Present value of £1 due  $x$  years hence.

In order, however, to simplify the construction of Tables **2** to **11** inclusive and also the subsequent Tables on joint lives, a Table, of which the following is a specimen, was formed to determine

$\lambda.p_x = \lambda.l_{x+1} - \lambda.l_x$ ;  $\lambda.p_x$  is constant for the same age throughout the whole of the Tables at whatever rate of interest they may be calculated.

$$\Delta\lambda.p_x = \lambda.p_{x+1} - \lambda.p_x$$

$$\lambda'.p_x = \text{co. log. } p_x$$

$$\Delta\lambda'.p_x = \lambda'.p_{x+1} - \lambda'.p_x$$

$p_x$  = Probability of living one year at age  $x$ .

The successive  $\lambda.D_x$  in the following Tables were produced by the continuous addition to the initial  $\lambda.D_x$  at the top of each column of  $\lambda.p_x$ , and also the constant  $\lambda.v$ ; but the same would obviously have been accomplished by the continuous addition of simply  $\lambda.v p_x$ , the values of which, at seven per cent., will be found in Table **12**, column 7.



TABLE 1,

Being preliminary to the Construction of Tables 2-11 inclusive.

| Age<br>$x$ | $l_x$  | $\lambda.l_x$ | $\lambda.p_x$ | $\Delta.\lambda.p_x$ | $\lambda'.p_x$ | $\Delta\lambda'.p_x$ | $\lambda.v^x = \lambda.(1.07)^x$ | Age<br>$x$ |
|------------|--------|---------------|---------------|----------------------|----------------|----------------------|----------------------------------|------------|
| 10         | 100000 | 5.0000000     | 9.9965511     | 0.0003913            | 0.0034489      | 9.9996087            | 9.7061622 23150                  | 10         |
| 11         | 99209  | 4.9965511     | .9969424      | .0002980             | .0030576       | .9997020             | .6767784 45465                   | 11         |
| 12         | 98513  | .9934935      | .9972404      | .0001966             | .0027596       | .9998034             | .6473946 67780                   | 12         |
| 13         | 97889  | .9907339      | .9974370      | 0.0000790            | .0025630       | 9.9999210            | .6180108 90095                   | 13         |
| 14         | 97313  | .9881709      | .9975160      | 9.9999541            | .0024840       | 0.0000459            | .5886271 12410                   | 14         |
| 15         | 96758  | .9856869      | .9974701      | .9998217             | .0025299       | .0001783             | .5592433 34725                   | 15         |
| 16         | 96196  | .9831570      | .9972918      | .9998093             | .0027082       | .0001907             | .5298590 57040                   | 16         |
| 17         | 95598  | .9804488      | .9971011      | .9998100             | .0028989       | .0001900             | .5004757 79355                   | 17         |
| 18         | 94962  | .9775499      | .9969111      | .9998249             | .0030889       | .0001751             | .4710920 01670                   | 18         |
| 19         | 94289  | 4.9744610     | .9967360      | .9998442             | .0032640       | .0001558             | 9.4417082 23985                  | 19         |
| 97         | 141    | 2.1492191     | .8001709      | .9986271             | .1998291       | .0013729             | 7.1497735 64555                  | 97         |
| 98         | 89     | 1.9493900     | .7987980      | .9970820             | .2012020       | .0029180             | .1203897 86870                   | 98         |
| 99         | 56     | .7481880      | .7958800      | 9.9822713            | .2041200       | 0.0177287            | .0910060 09185                   | 99         |
| 100        | 35     | .5440680      | .7781513      | 0.0135728            | .2218487       | 9.9864272            | .0616222 31500                   | 100        |
| 101        | 21     | .3222193      | .7917241      | 9.9974225            | .2082759       | 0.0025775            | .0322384 53815                   | 101        |
| 102        | 13     | 1.1139434     | .7891466      | 0.0067334            | .2108534       | 9.9932666            | 7.0028546 76130                  | 102        |
| 103        | 8      | 0.9030900     | .7958800      | 9.9822713            | .2041200       | 0.0177287            | 6.9734708 98445                  | 103        |
| 104        | 5      | .6989700      | .7781513      | 9.7447274            | .2218487       | 0.2552726            | .9440871 20760                   | 104        |
| 105        | 3      | .4771213      | 9.5228787     | ...                  | 0.4771213      | ...                  | .9147033 43075                   | 105        |
| 106        | 1      | 0.0000000     | ...           | ...                  | ...            | ...                  | 6.8853195 65390                  | 106        |

Abstract shewing the process of calculation adopted in the Construction of Tables 2-11 inclusive.

| Specimen of the actual Calculation of Table 8, in which $v = (1.07)^{-x}$ . |                                |          |           |               |            |                                |          |          |               |
|-----------------------------------------------------------------------------|--------------------------------|----------|-----------|---------------|------------|--------------------------------|----------|----------|---------------|
| Age<br>$x$                                                                  | $\lambda.D_x$<br>$\lambda.p_x$ | $D_x$    | $N_x$     | $\lambda.N_x$ | Age<br>$x$ | $\lambda.D_x$<br>$\lambda.p_x$ | $D_x$    | $N_x$    | $\lambda.N_x$ |
| 10                                                                          | 4.7061622                      | 50834.93 | 638415.36 | 5.8051034     | 97         | 9.2989927                      | .1990640 | .2803795 | 9.4477462     |
| 11                                                                          | 9.9965511                      | 47133.47 | 591281.89 | .7717946      | 98         | 9.8001709                      | .1174302 | .1629493 | 9.2120525     |
| 12                                                                          | .6733295                       | 43740.95 | 547540.94 | .7384166      | 99         | 9.0697798                      | .0690548 | .0938945 | 8.9726402     |
| 13                                                                          | .9969424                       | 40620.46 | 506920.48 | .7049398      | 100        | .7987980                       | .0439358 | .0508587 | .7063653      |
| 14                                                                          | .6408882                       | 37739.67 | 469180.81 | .6713402      | 101        | 8.8391940                      | .0226182 | .0282405 | .4508724      |
| 15                                                                          | .9972404                       | 35069.55 | 434111.26 | .6376011      | 102        | .7958800                       | .0130857 | .0151548 | 8.1805502     |
| 16                                                                          | .6087448                       | 32584.92 | 401526.34 | .6037140      | 103        | .7781513                       | .0075259 | .0076289 | 7.8824619     |
| 17                                                                          | .9974370                       | 30263.88 | 371262.46 | .5696811      | 104        | .3544578                       | .0043960 | .0032329 | 7.5095923     |
| 18                                                                          | .5767980                       | 28095.83 | 343166.63 | .5355051      | 105        | .7917241                       | .0024650 | .0007679 | 6.8853196     |
| 19                                                                          | .9975160                       | 26071.69 | 317094.94 | 5.5011892     | 106        | .7891466                       | .0007679 | .0000000 | ...           |
|                                                                             | .5449302                       |          |           |               |            | 7.8765609                      |          |          |               |
|                                                                             | .9974701                       |          |           |               |            | .7958800                       |          |          |               |
|                                                                             | .5130165                       |          |           |               |            | .6430571                       |          |          |               |
|                                                                             | .9972918                       |          |           |               |            | .7781513                       |          |          |               |
|                                                                             | .4809246                       |          |           |               |            | 7.3918246                      |          |          |               |
|                                                                             | .9971011                       |          |           |               |            | 9.5228787                      |          |          |               |
|                                                                             | .4486419                       |          |           |               |            | 6.8853196                      |          |          |               |
|                                                                             | .9969111                       |          |           |               |            |                                |          |          |               |
|                                                                             | 4.4161692                      |          |           |               |            |                                |          |          |               |
|                                                                             | 9.9967360                      |          |           |               |            |                                |          |          |               |

After this explanation the "headings" of the different Tables will sufficiently shew the other details of their construction. The various Tables were, at frequent intervals during the progress of their formation by the preceding method, checked by the direct mode of calculation employed in forming Table VI, page 149 and Table A U, page 494, ante.



TABLE 2.

*England and Wales.—Whole Population.—Single Lives.—Males.—Three per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$      | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$      |
|------------|---------------------|---------------------|----------|------------|------------|---------------------|---------------------|----------|------------|
| 10         | 4.8716278           | 6.2354703           | 74409.40 | 1719770.49 | 59         | 3.9836213           | 5.0263583           | 9629.890 | 106257.227 |
| 11         | .8553416            | .2169836            | 71670.69 | 1648099.80 | 60         | .9589718            | 4.9874816           | 9098.542 | 97158.685  |
| 12         | .8394468            | .1983835            | 69095.03 | 1579004.77 | 61         | .9335836            | .9473199            | 8581.903 | 88576.782  |
| 13         | .8238500            | .1796515            | 66657.65 | 1512347.12 | 62         | .9073405            | .9057856            | 8078.681 | 80498.101  |
| 14         | .8084498            | .1607722            | 64335.37 | 1448011.75 | 63         | .8801905            | .8627811            | 7589.104 | 72908.997  |
| 15         | .7931285            | .1417338            | 62105.28 | 1385906.47 | 64         | .8520006            | .8182051            | 7112.145 | 65796.852  |
| 16         | .7777614            | .1225304            | 59946.16 | 1325960.31 | 65         | .8227032            | .7719450            | 6648.187 | 59148.665  |
| 17         | .7622160            | .1031610            | 57838.36 | 1268121.95 | 66         | .7921500            | .7238833            | 6196.551 | 52952.114  |
| 18         | .7464799            | .0836251            | 55780.18 | 1212341.77 | 67         | .7602918            | .6738855            | 5758.267 | 47193.847  |
| 19         | .7305537            | .0639323            | 53771.69 | 1158570.08 | 68         | .7269627            | .6218092            | 5332.891 | 41860.956  |
| 20         | .7144525            | .0440516            | 51814.64 | 1106755.44 | 69         | .6920908            | .5674914            | 4921.424 | 36939.532  |
| 21         | .6981955            | .0240113            | 49910.91 | 1056844.53 | 70         | .6554714            | .5107603            | 4523.467 | 32416.065  |
| 22         | .6818030            | 6.0037974           | 48062.13 | 1008782.40 | 71         | .6169852            | .4514212            | 4139.858 | 28276.207  |
| 23         | .6652812            | 5.9834072           | 46268.05 | 962514.35  | 72         | .5763679            | .3892720            | 3770.231 | 24505.976  |
| 24         | .6486224            | .9628367            | 44526.89 | 917987.46  | 73         | .5334695            | .3240840            | 3415.620 | 21090.356  |
| 25         | .6318231            | .9420825            | 42837.40 | 875150.06  | 74         | .4879703            | .2556216            | 3075.886 | 18014.470  |
| 26         | .6148994            | .9211400            | 41200.20 | 833949.86  | 75         | .4397274            | .1836106            | 2752.501 | 15261.969  |
| 27         | .5978726            | .9000030            | 39616.18 | 794333.68  | 76         | .3883024            | .1077810            | 2445.132 | 12816.836  |
| 28         | .5807553            | .8786645            | 38085.12 | 756248.56  | 77         | .3334634            | 4.0278288           | 2155.080 | 10661.757  |
| 29         | .5635602            | .8571164            | 36606.67 | 719641.89  | 78         | .2746755            | 3.9434706           | 1882.242 | 8779.515   |
| 30         | .5463107            | .8353485            | 35181.21 | 684460.68  | 79         | .2116077            | .8544087            | 1627.825 | 7151.690   |
| 31         | .5290055            | .8133499            | 33806.91 | 650653.77  | 80         | .1437530            | .7603716            | 1392.365 | 5759.325   |
| 32         | .5116436            | .7911091            | 32482.06 | 618171.71  | 81         | 3.0709765           | .6610344            | 1177.543 | 4581.7819  |
| 33         | .4942288            | .7686132            | 31205.33 | 586966.38  | 82         | 2.9927879           | .5560915            | 983.5307 | 3598.2512  |
| 34         | .4767494            | .7458491            | 29974.33 | 556992.05  | 83         | .9090680            | .4451624            | 811.0881 | 2787.1631  |
| 35         | .4592036            | .7228022            | 28787.48 | 528204.57  | 84         | .8194651            | .3278252            | 659.8802 | 2127.2829  |
| 36         | .4415846            | .6994575            | 27642.96 | 500561.61  | 85         | .7236160            | .2036008            | 529.1954 | 1598.0875  |
| 37         | .4238849            | .6757991            | 26539.02 | 474022.59  | 86         | .6207659            | 3.0720593           | 417.6052 | 1180.4823  |
| 38         | .4060970            | .6518096            | 25473.99 | 448548.60  | 87         | .5105274            | 2.9327251           | 323.9869 | 856.4954   |
| 39         | .3882070            | .6274709            | 24445.95 | 424102.65  | 88         | .3910697            | .7856281            | 246.0762 | 610.4192   |
| 40         | .3701951            | .6027649            | 23452.83 | 400649.82  | 89         | .2641975            | .6311207            | 182.7374 | 427.6818   |
| 41         | .3520634            | .5776710            | 22493.83 | 378155.99  | 90         | 2.1281772           | .4673868            | 134.3313 | 293.35054  |
| 42         | .3337850            | .5521681            | 21566.77 | 356589.22  | 91         | 1.9828759           | .2949440            | 96.13375 | 197.21679  |
| 43         | .3153548            | .5262339            | 20670.68 | 335918.54  | 92         | .8280010            | 2.1136731           | 67.29773 | 129.91906  |
| 44         | .2967503            | .4998447            | 19803.88 | 316114.66  | 93         | .6628670            | 1.9238008           | 46.01156 | 83.90750   |
| 45         | .2779591            | .4729748            | 18965.27 | 297149.39  | 94         | .4879061            | .7255293            | 30.75432 | 53.15318   |
| 46         | .2589685            | .4455972            | 18153.84 | 278995.55  | 95         | .3029079            | .5193884            | 20.08667 | 33.06651   |
| 47         | .2397710            | .4176821            | 17368.85 | 261626.70  | 96         | 1.1080705           | .3062345            | 12.82539 | 20.241116  |
| 48         | .2203462            | .3891972            | 16609.11 | 245017.59  | 97         | 0.9040083           | 1.0872197           | 8.016932 | 12.224184  |
| 49         | .2006785            | .3601083            | 15873.71 | 229143.88  | 98         | .6913420            | 0.8639910           | 4.912946 | 7.311238   |
| 50         | .1807449            | .3303779            | 15161.59 | 213982.29  | 99         | .4773028            | .6344757            | 3.001254 | 4.309984   |
| 51         | .1605272            | .2999654            | 14471.95 | 199510.34  | 100        | .2603455            | .3959961            | 1.821149 | 2.488835   |
| 52         | .1399723            | .2688292            | 13802.96 | 185707.38  | 101        | 0.0256596           | 0.1547194           | 1.060864 | 1.4279709  |
| 53         | .1190573            | .2369235            | 13153.99 | 172553.39  | 102        | 9.8045465           | 9.8978324           | .6375974 | .7903735   |
| 54         | .0977362            | .2042003            | 12523.80 | 160029.59  | 103        | .5808559            | .6121840            | .3809394 | .4094341   |
| 55         | .0759663            | .1706081            | 11911.50 | 148118.09  | 104        | .3639986            | 9.2509774           | .2312055 | .1782286   |
| 56         | .0537085            | .1360915            | 11316.40 | 136801.69  | 105        | 9.1292127           | 8.6392542           | .1346519 | .0435767   |
| 57         | .0309418            | .1005884            | 10738.46 | 126063.23  | 106        | 8.6392542           | ...                 | .0435767 | .0000000   |
| 58         | 4.0075817           | 5.0640352           | 10176.11 | 115887.13  |            |                     |                     |          |            |



TABLE 3.

*England and Wales.—Whole Population.—Single Lives.—Males.—Three and a Half per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$      | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|------------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.8505965           | 6.1737697           | 70891.88 | 1492003.00 | 59         | 3.8595370           | 4.8836423           | 7236.641 | 76496.626 |
| 11         | .8322073            | .1535252            | 67952.79 | 1424050.21 | 60         | .8327843            | .8431849            | 6804.314 | 69692.312 |
| 12         | .8142093            | .1331734            | 65194.25 | 1358855.96 | 61         | .8052930            | .8014406            | 6386.942 | 63305.370 |
| 13         | .7965094            | .1126937            | 62590.64 | 1296265.32 | 62         | .7769467            | .7583212            | 5983.381 | 57321.989 |
| 14         | .7790060            | .0920705            | 60118.20 | 1236147.12 | 63         | .7476937            | .7137287            | 5593.630 | 51728.359 |
| 15         | .7615817            | .0712903            | 57753.95 | 1178393.17 | 64         | .7174006            | .6675613            | 5216.757 | 46511.602 |
| 16         | .7441114            | .0503473            | 55476.80 | 1122916.37 | 65         | .6860001            | .6197059            | 4852.886 | 41658.716 |
| 17         | .7264629            | .0292414            | 53267.57 | 1069648.80 | 66         | .6533437            | .5700448            | 4501.359 | 37157.357 |
| 18         | .7086236            | .0079717            | 51123.85 | 1018524.95 | 67         | .6193825            | .5184428            | 4162.771 | 32994.586 |
| 19         | .6905944            | .5.9865389          | 49044.96 | 969479.99  | 68         | .5839502            | .4647570            | 3836.633 | 29157.953 |
| 20         | .6723900            | .9649420            | 47031.63 | 922448.36  | 69         | .5469752            | .4088241            | 3523.507 | 25634.446 |
| 21         | .6540299            | .9431796            | 45084.77 | 877363.59  | 70         | .5082526            | .3504709            | 3222.943 | 22411.503 |
| 22         | .6355342            | .9160108            | 43205.02 | 834158.57  | 71         | .4676634            | .2895024            | 2935.374 | 19476.129 |
| 23         | .6169094            | .8991457            | 41391.33 | 792767.24  | 72         | .4249429            | .2257162            | 2660.375 | 16815.754 |
| 24         | .5981474            | .8768676            | 39641.25 | 753125.99  | 73         | .3799414            | .1588821            | 2398.518 | 14417.236 |
| 25         | .5792450            | .8544112            | 37952.91 | 715173.08  | 74         | .3323390            | .0887642            | 2149.508 | 12267.728 |
| 26         | .5602181            | .8317719            | 36326.04 | 678847.04  | 75         | .2819931            | .4.0150872          | 1914.226 | 10353.502 |
| 27         | .5410883            | .8089442            | 34760.68 | 644086.36  | 76         | .2284649            | 3.9375806           | 1692.251 | 8661.251  |
| 28         | .5218678            | .7859208            | 33255.83 | 610830.53  | 77         | .1715228            | .8559397            | 1484.304 | 7176.947  |
| 29         | .5025696            | .7626937            | 31810.43 | 579020.10  | 78         | .1106317            | .7698810            | 1290.125 | 5886.822  |
| 30         | .4832169            | .7392526            | 30424.04 | 548596.06  | 79         | 3.0454609           | .6791071            | 1110.352 | 4776.4702 |
| 31         | .4638087            | .7155870            | 29094.35 | 519501.71  | 80         | 2.9755030           | .5833479            | 945.1549 | 3831.3153 |
| 32         | .4443436            | .6916848            | 27819.13 | 491682.58  | 81         | .9006234            | .4822798            | 795.4692 | 3035.8461 |
| 33         | .4248257            | .6675333            | 26596.58 | 465086.00  | 82         | .8203316            | .3755993            | 661.1981 | 2374.6480 |
| 34         | .4052431            | .6431190            | 25423.95 | 439662.05  | 83         | .7345087            | .2629284            | 542.6361 | 1832.0119 |
| 35         | .3855943            | .6184275            | 24299.33 | 415362.72  | 84         | .6428026            | .1438482            | 439.3419 | 1392.6700 |
| 36         | .3658721            | .5934435            | 23220.53 | 392142.19  | 85         | .5448504            | 3.0178840           | 350.6310 | 1042.0390 |
| 37         | .3460693            | .5681509            | 22185.50 | 369956.69  | 86         | .4398971            | 2.8846149           | 275.3577 | 766.6813  |
| 38         | .3261782            | .5425322            | 21192.30 | 348764.39  | 87         | .3275555            | .7435765            | 212.5962 | 554.0851  |
| 39         | .3061852            | .5165692            | 20238.82 | 328525.57  | 88         | .2059947            | .5948265            | 160.6922 | 393.3929  |
| 40         | .2860701            | .4902434            | 19322.80 | 309202.77  | 89         | 2.0770194           | .4377328            | 119.4041 | 273.98877 |
| 41         | .2658353            | .4635341            | 18443.16 | 290759.61  | 90         | 1.9388959           | .2721052            | 86.87522 | 187.11355 |
| 42         | .2454537            | .4364203            | 17597.61 | 273162.00  | 91         | .7914905            | 2.0977503           | 61.87148 | 125.24207 |
| 43         | .2249205            | .4088790            | 16784.97 | 256377.03  | 92         | .6345125            | 1.9145472           | 43.10350 | 82.13857  |
| 44         | .2042128            | .3808868            | 16003.42 | 240373.61  | 93         | .4672754            | .7227248            | 29.32752 | 52.81105  |
| 45         | .1833185            | .3524177            | 15251.71 | 225121.90  | 94         | .2902113            | .5224848            | 19.50794 | 33.30311  |
| 46         | .1622247            | .3234445            | 14528.63 | 210593.27  | 95         | 1.1031100           | .3143598            | 12.67973 | 20.623376 |
| 47         | .1409242            | .2939368            | 13833.25 | 196760.02  | 96         | 0.9061695           | 1.0992126           | 8.056929 | 12.566447 |
| 48         | .1193962            | .2638627            | 13164.25 | 183595.77  | 97         | .7000042            | 0.8782071           | 5.011921 | 7.554526  |
| 49         | .0976254            | .2331870            | 12520.61 | 171075.16  | 98         | .4852347            | .6530151            | 3.056572 | 4.497954  |
| 50         | .0755886            | .2018721            | 11901.14 | 159174.02  | 99         | .2690924            | .4215636            | 1.858199 | 2.639755  |
| 51         | .0532679            | .1698775            | 11304.93 | 147869.09  | 100        | 0.0500330           | 0.1811719           | 1.122104 | 1.5176511 |
| 52         | .0306098            | .1371603            | 10730.25 | 137138.84  | 101        | 9.8132440           | 9.9380972           | .6504951 | .8671560  |
| 53         | 4.0075917           | .1036755            | 10176.34 | 126962.499 | 102        | .5900277            | .6795061            | .3890700 | .4780860  |
| 54         | 3.9841674           | .0693739            | 9642.006 | 117320.493 | 103        | .3642340            | .3922658            | .2313311 | .2467549  |
| 55         | .9602945            | 5.0342039           | 9126.295 | 108194.198 | 104        | 9.1451736           | 9.0296361           | .1396927 | .1070622  |
| 56         | .9359335            | 4.9981099           | 8628.464 | 99565.734  | 105        | 8.9083846           | 8.4163229           | .0809813 | .0260809  |
| 57         | .9110637            | .9610293            | 8148.236 | 91417.498  | 106        | 8.4163229           | ...                 | .0260809 | .0000000  |
| 58         | 3.8856004           | 4.9228981           | 7684.231 | 83733.267  |            |                     |                     |          |           |



TABLE 4.

*England and Wales.—Whole Population.—Single Lives.—Males.—Four per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$      | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|------------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.8296666           | 6.1147133           | 67566.41 | 1302307.37 | 59         | 3.7360506           | 4.7420372           | 5445.661 | 55212.475 |
| 11         | .8091844            | .0926727            | 64444.28 | 1237863.09 | 60         | .7072049            | .6999831            | 5095.712 | 50116.763 |
| 12         | .7890934            | .0705299            | 61530.92 | 1176332.17 | 61         | .6776206            | .6566406            | 4760.150 | 45356.613 |
| 13         | .7693005            | .0482643            | 58789.60 | 1117542.57 | 62         | .6471814            | .6119215            | 4437.939 | 40918.674 |
| 14         | .7497041            | .0258573            | 56195.83 | 1061346.74 | 63         | .6158353            | .5657269            | 4128.909 | 36789.765 |
| 15         | .7301868            | 6.0032968           | 53726.28 | 1007620.46 | 64         | .5834493            | .5179554            | 3832.210 | 32957.555 |
| 16         | .7106236            | 5.9805763           | 51359.83 | 956260.63  | 65         | .5499557            | .4684918            | 3547.772 | 29409.783 |
| 17         | .6908820            | .9576950            | 49077.46 | 907183.17  | 66         | .5152064            | .4172195            | 3274.963 | 26134.820 |
| 18         | .6709498            | .9346535            | 46875.92 | 860307.25  | 67         | .4791522            | .3640011            | 3014.062 | 23120.758 |
| 19         | .6508275            | .9114526            | 44753.55 | 815553.70  | 68         | .4416269            | .3086964            | 2764.565 | 20356.193 |
| 20         | .6305302            | .8880916            | 42710.06 | 772843.64  | 69         | .4025589            | .2511382            | 2526.731 | 17829.462 |
| 21         | .6100771            | .8645694            | 40745.26 | 732098.38  | 70         | .3617433            | .1911541            | 2300.081 | 15529.381 |
| 22         | .5894884            | .8408834            | 38858.72 | 693239.66  | 71         | .3190611            | .1285479            | 2084.784 | 13444.597 |
| 23         | .5687706            | .8170304            | 37048.50 | 656191.16  | 72         | .2742477            | 4.0631160           | 1880.389 | 11564.208 |
| 24         | .5479157            | .7930075            | 35311.46 | 620879.70  | 73         | .2271531            | 3.9946277           | 1687.148 | 9877.060  |
| 25         | .5269202            | .7688117            | 33644.98 | 587234.72  | 74         | .1774578            | .9228466            | 1504.727 | 8372.333  |
| 26         | .5058004            | .7444391            | 32047.96 | 555186.76  | 75         | .1250189            | .8474958            | 1333.580 | 7038.753  |
| 27         | .4845775            | .7198838            | 30519.51 | 524667.25  | 76         | .0693977            | .7683039            | 1173.269 | 5865.484  |
| 28         | .4632641            | .6951396            | 29057.89 | 495609.36  | 77         | 3.0103626           | .6849652            | 1024.148 | 4841.336  |
| 29         | .4418729            | .6701976            | 27661.32 | 467948.04  | 78         | 2.9473785           | .5971958            | 8858.873 | 3955.4492 |
| 30         | .4204272            | .6450482            | 26328.57 | 441619.47  | 79         | .8801147            | .5046980            | 758.7779 | 3196.6713 |
| 31         | .3989260            | .6196804            | 25056.82 | 416562.65  | 80         | .8080639            | .4072020            | 642.7823 | 2553.8890 |
| 32         | .3773679            | .5940822            | 23843.38 | 392719.27  | 81         | .7310912            | .3043841            | 538.3828 | 2015.5062 |
| 33         | .3557570            | .5682408            | 22685.95 | 370033.32  | 82         | .6487065            | .1959415            | 445.3552 | 1570.1510 |
| 34         | .3340815            | .5421427            | 21581.50 | 348451.82  | 83         | .5607905            | 3.0814956           | 363.7395 | 1206.4115 |
| 35         | .3123396            | .5157734            | 20527.67 | 327924.15  | 84         | .4669915            | 2.9606266           | 293.0836 | 913.3279  |
| 36         | .2905245            | .4891173            | 19522.01 | 308402.14  | 85         | .3669463            | .8328584            | 232.7803 | 680.5476  |
| 37         | .2686286            | .4621583            | 18562.16 | 289839.98  | 86         | .2599000            | .6977692            | 181.9282 | 498.6194  |
| 38         | .2466446            | .4348786            | 17645.93 | 272194.05  | 87         | .1454654            | .5548922            | 139.7865 | 358.8329  |
| 39         | .2245586            | .4072601            | 16770.99 | 255423.06  | 88         | 2.0218116           | .4042901            | 105.1506 | 253.6823  |
| 40         | .2023505            | .3792840            | 15934.94 | 239488.12  | 89         | 1.8907433           | .2453266            | 77.75768 | 175.92460 |
| 41         | .1800227            | .3509294            | 15136.40 | 224351.72  | 90         | .7505269            | 2.0778118           | 56.30240 | 119.62220 |
| 42         | .1575481            | .3221752            | 14373.03 | 209978.69  | 91         | .6010294            | 1.9015510           | 39.90519 | 79.71701  |
| 43         | .1349219            | .2929985            | 13643.38 | 196335.31  | 92         | .4419585            | .7164227            | 27.66677 | 52.05024  |
| 44         | .1121213            | .2633750            | 12945.57 | 183389.74  | 93         | .2726283            | .5226572            | 18.73391 | 33.31633  |
| 45         | .0891339            | .2332794            | 12278.18 | 171111.56  | 94         | 1.0934713           | .3204560            | 12.40142 | 20.91491  |
| 46         | .0659472            | .2026836            | 11639.84 | 159471.72  | 95         | 0.9042770           | 1.1103543           | 8.021896 | 12.893010 |
| 47         | .0425537            | .1715577            | 11029.45 | 148442.27  | 96         | .7052435            | 0.8932212           | 5.072751 | 7.820259  |
| 48         | 4.0189327           | .1398686            | 10445.58 | 137996.69  | 97         | .4969852            | .6702328            | 3.140401 | 4.679858  |
| 49         | 3.9950689           | .1075816            | 9887.098 | 128109.589 | 98         | .2801227            | .4430844            | 1.905999 | 2.773859  |
| 50         | .9709391            | .0746584            | 9352.746 | 118756.843 | 99         | 0.0618874           | 0.2097039           | 1.153154 | 1.620705  |
| 51         | .9465254            | .0410587            | 8841.489 | 109915.354 | 100        | 9.8407341           | 9.9674093           | .6930014 | .9277037  |
| 52         | .9217744            | 5.0067385           | 8351.690 | 101563.664 | 101        | .6018520            | .7225479            | .3998084 | .5278953  |
| 53         | .8966632            | 4.9716524           | 7882.486 | 93681.178  | 102        | .3765428            | .4622693            | .2379812 | .2899141  |
| 54         | .8711460            | .9357515            | 7432.689 | 86248.489  | 103        | 9.1486561           | 9.1734680           | .1408174 | .1490967  |
| 55         | .8451800            | .8989838            | 7001.321 | 79247.168  | 104        | 8.9275027           | 8.8093637           | .0846258 | .0644709  |
| 56         | .8187261            | .8612929            | 6587.583 | 72659.585  | 105        | .6886207            | 8.1944660           | .0488226 | .0156483  |
| 57         | .7917633            | .8226162            | 6191.036 | 66468.549  | 106        | 8.1944660           | ...                 | .0156483 | .0000000  |
| 58         | 3.7642070           | 4.7828891           | 5810.413 | 60658.136  |            |                     |                     |          |           |



TABLE 5.

*England and Wales.—Whole Population.—Single Lives.—Males.—Four-and-a-Half per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$      | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|------------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.8088371           | 6.0580967           | 6439.277 | 1143133.15 | 59         | 3.6131565           | 4.6015224           | 4103.520 | 39950.513 |
| 11         | .7862719            | .0342277            | 61132.47 | 1082000.68 | 60         | .5822279            | .5578567            | 3821.448 | 36129.065 |
| 12         | .7640980            | 6.0102622           | 58089.55 | 1023911.13 | 61         | .5505606            | .5129025            | 3552.717 | 32576.348 |
| 13         | .7422221            | 5.9861702           | 55253.99 | 968657.14  | 62         | .5180384            | .4665702            | 3296.413 | 29279.935 |
| 14         | .7205428            | .9619480            | 52546.38 | 916110.76  | 63         | .4846094            | .4187612            | 3052.175 | 26227.760 |
| 15         | .6989425            | .9375750            | 49996.84 | 866113.92  | 64         | .4501404            | .3693728            | 2819.295 | 23408.465 |
| 16         | .6772964            | .9130441            | 47565.97 | 818547.95  | 65         | .4145639            | .3182911            | 2597.550 | 20810.915 |
| 17         | .6554719            | .8883554            | 45234.72 | 773313.23  | 66         | .3777316            | .2653976            | 2386.336 | 18424.579 |
| 18         | .6334567            | .8635098            | 42998.83 | 730314.40  | 67         | .3395944            | .2105555            | 2185.719 | 16238.860 |
| 19         | .6112515            | .8385084            | 40855.59 | 689458.81  | 68         | .2999862            | .1536216            | 1995.199 | 14243.661 |
| 20         | .5888712            | .8133510            | 38803.53 | 650655.28  | 69         | .2588353            | .0944303            | 1814.827 | 12428.834 |
| 21         | .5663351            | .7880368            | 36841.31 | 613813.97  | 70         | .2159368            | 4.0328080           | 1644.133 | 10784.701 |
| 22         | .5436635            | .7625634            | 34967.41 | 578846.56  | 71         | .1711716            | 3.9685576           | 1483.104 | 9301.597  |
| 23         | .5208627            | .7369282            | 33178.96 | 545667.60  | 72         | .1242752            | .9014747            | 1331.298 | 7970.299  |
| 24         | .4979248            | .7111284            | 31472.04 | 514195.56  | 73         | .0750977            | .8313277            | 1188.770 | 6781.529  |
| 25         | .4748464            | .6851614            | 29843.26 | 484352.30  | 74         | 3.0233194           | .7578792            | 1055.163 | 5726.366  |
| 26         | .4516436            | .6590236            | 28290.69 | 456061.61  | 75         | 2.9687075           | .6808513            | 930.6738 | 4795.6924 |
| 27         | .4283379            | .6327094            | 26812.54 | 429249.07  | 76         | .9110934            | .5999718            | 814.8795 | 3980.8129 |
| 28         | .4049415            | .6062124            | 25406.31 | 403842.76  | 77         | .8499753            | .5149336            | 707.9055 | 3272.9074 |
| 29         | .3814673            | .5795244            | 24069.51 | 379773.25  | 78         | .7849083            | .4254525            | 609.4082 | 2663.4992 |
| 30         | .3579387            | .5526354            | 22800.20 | 356973.05  | 79         | .7155616            | .3312304            | 519.4713 | 2144.0279 |
| 31         | .3343545            | .5255346            | 21595.07 | 335377.98  | 80         | .6414278            | .2319982            | 437.9533 | 1706.0746 |
| 32         | .3107135            | .4982099            | 20450.95 | 314927.03  | 81         | .5623722            | .1274314            | 365.0666 | 1341.0080 |
| 33         | .2870196            | .4706485            | 19365.09 | 295561.94  | 82         | .4779045            | 3.0172282           | 300.5415 | 1040.4665 |
| 34         | .2632611            | .4428368            | 18334.17 | 277227.77  | 83         | .3879056            | 2.9010094           | 244.2899 | 796.1766  |
| 35         | .2394363            | .4147600            | 17355.47 | 259872.30  | 84         | .2920236            | .7783550            | 195.8951 | 600.2815  |
| 36         | .2155382            | .3864028            | 16426.24 | 243446.06  | 85         | .1898954            | .6487865            | 154.8443 | 445.4372  |
| 37         | .1915595            | .3577485            | 15543.88 | 227902.18  | 86         | 2.0807662           | .5118814            | 120.4387 | 324.9985  |
| 38         | .1674925            | .3287794            | 14705.93 | 213196.25  | 87         | 1.9642486           | .3671710            | 92.09766 | 232.90083 |
| 39         | .1433235            | .2994777            | 13909.85 | 199286.40  | 88         | .8385119            | .2147231            | 68.94645 | 163.95438 |
| 40         | .1190325            | .2698239            | 13153.24 | 186133.16  | 89         | .7053607            | 2.0538967           | 50.74126 | 113.21312 |
| 41         | .0946217            | .2397970            | 12434.31 | 173698.85  | 90         | .5630613            | 1.8845036           | 36.56464 | 76.64848  |
| 42         | .0700642            | .2093759            | 11750.71 | 161948.14  | 91         | .4114809            | .7063484            | 25.79175 | 50.85673  |
| 43         | .0453550            | .1785376            | 11100.82 | 150847.32  | 92         | .2503270            | .5193099            | 17.79619 | 33.06054  |
| 44         | 4.0204714           | .1472580            | 10482.66 | 140364.66  | 93         | 1.0789139           | .3236217            | 11.99262 | 21.067921 |
| 45         | 3.9954011           | .1155107            | 9894.665 | 130469.982 | 94         | 0.8976739           | 1.1194292           | 7.902671 | 13.165250 |
| 46         | .9701314            | .0832683            | 9335.367 | 121134.615 | 95         | .7063966            | 0.9073583           | 5.086237 | 8.079013  |
| 47         | .9446549            | .0505001            | 8803.490 | 112331.125 | 96         | .5052802            | .6882467            | 3.200959 | 4.878054  |
| 48         | .9189511            | 5.0171736           | 8297.573 | 104033.552 | 97         | .2949389            | .4632820            | 1.972145 | 2.905909  |
| 49         | .8980043            | 4.9832527           | 7816.355 | 96217.197  | 98         | 0.0759935           | 0.2341843           | 1.191224 | 1.7146849 |
| 50         | .8667916            | .9486997            | 7358.539 | 88858.658  | 99         | 9.8556752           | 9.9988812           | .7172577 | .9974272  |
| 51         | .8402949            | .9134730            | 6923.009 | 81935.649  | 100        | .6324390            | .7546887            | .4289819 | .5684453  |
| 52         | .8134609            | .8775294            | 6508.201 | 75427.448  | 101        | .3914740            | .5080446            | .2463054 | .3221399  |
| 53         | .7862668            | .8408227            | 6113.175 | 69314.273  | 102        | 9.1640818           | 9.2460823           | .1459089 | .1762310  |
| 54         | .7586666            | .8033035            | 5736.758 | 63577.515  | 103        | 8.9341121           | 8.9557238           | .0859235 | .0903075  |
| 55         | .7306177            | .7649197            | 5377.961 | 58199.554  | 104        | .7108758            | 8.5901483           | .0513897 | .0389178  |
| 56         | .7020808            | .7256145            | 5035.943 | 53163.611  | 105        | 8.4699108           | 7.9736732           | .0295060 | .0094118  |
| 57         | .6730350            | .6853248            | 4710.153 | 48453.458  | 106        | 7.9736732           | ...                 | .0094118 | .0000000  |
| 58         | 3.6433959           | 4.6439856           | 4399.425 | 44054.033  |            |                     |                     |          |           |



TABLE 6.

*England and Wales.—Whole Population.—Single Lives.—Males.—Five per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$      | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|------------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.7881070           | 6.0037014           | 61391.32 | 1008559.17 | 59         | 3.4908490           | 4.4620736           | 3096.343 | 28978.349 |
| 11         | .7634688            | 5.9779767           | 58005.45 | 950553.72  | 60         | .4578474            | .4167831            | 2869.772 | 26108.577 |
| 12         | .7392219            | .9521616            | 54855.72 | 895698.00  | 61         | .4241071            | .3702044            | 2655.260 | 23453.317 |
| 13         | .7152730            | .9262320            | 51912.63 | 843785.37  | 62         | .3895119            | .3222475            | 2451.952 | 21001.365 |
| 14         | .6915207            | .9001681            | 49149.68 | 794635.69  | 63         | .3540099            | .2728131            | 2259.487 | 18741.878 |
| 15         | .6678474            | .8739558            | 46542.25 | 748093.44  | 64         | .3174679            | .2217983            | 2077.150 | 16664.728 |
| 16         | .6441282            | .8475881            | 44068.50 | 704024.94  | 65         | .2798184            | .1690882            | 1904.664 | 14760.064 |
| 17         | .6202307            | .8210652            | 41709.09 | 662315.85  | 66         | .2409131            | .1145646            | 1741.458 | 13018.606 |
| 18         | .5961425            | .7943884            | 39458.68 | 622857.17  | 67         | .2007029            | 4.0580899           | 1587.460 | 11431.146 |
| 19         | .5718643            | .7675594            | 37313.36 | 585543.81  | 68         | .1590217            | 3.9995202           | 1442.188 | 9988.958  |
| 20         | .5474110            | .7405785            | 35270.45 | 550273.36  | 69         | .1157977            | .9386895            | 1305.563 | 8683.395  |
| 21         | .5228019            | .7134451            | 33327.44 | 516945.92  | 70         | .0708262            | .8754236            | 1177.135 | 7506.260  |
| 22         | .4980573            | .6861574            | 31481.64 | 485464.28  | 71         | 3.0239880           | .8095241            | 1056.788 | 6449.472  |
| 23         | .4731835            | .6587125            | 29729.22 | 455735.06  | 72         | 2.9750186           | .7407866            | 944.1013 | 5505.3708 |
| 24         | .4481726            | .6311084            | 28065.49 | 427669.57  | 73         | .9237681            | .6689782            | 839.0118 | 4666.3590 |
| 25         | .4230212            | .6033428            | 26486.29 | 401183.28  | 74         | .8699168            | .5938608            | 741.1682 | 3925.1908 |
| 26         | .3977454            | .5754124            | 24988.80 | 376194.48  | 75         | .8133219            | .5151555            | 650.6118 | 3274.5790 |
| 27         | .3723666            | .5473119            | 23570.38 | 352624.10  | 76         | .7535448            | .4325891            | 566.9500 | 2707.6290 |
| 28         | .3468972            | .5190352            | 22227.84 | 330396.26  | 77         | .6903537            | .3458540            | 490.1779 | 2217.4511 |
| 29         | .3213500            | .4905740            | 20958.01 | 309438.25  | 78         | .6232137            | .2546653            | 419.9656 | 1797.4855 |
| 30         | .2957484            | .4619185            | 19758.25 | 289680.00  | 79         | .5517939            | .1587255            | 356.2820 | 1441.2035 |
| 31         | .2700912            | .4330577            | 18624.78 | 271055.22  | 80         | .4755871            | 3.0577655           | 298.9421 | 1142.2614 |
| 32         | .2443772            | .4039800            | 17554.05 | 253501.17  | 81         | .3944585            | 2.9514625           | 248.0039 | 894.2575  |
| 33         | .2186103            | .3746719            | 16542.85 | 236958.32  | 82         | .3079178            | .8395159            | 203.1973 | 691.0602  |
| 34         | .1927788            | .3451202            | 15587.59 | 221370.73  | 83         | .2158459            | .7215479            | 164.3788 | 526.6814  |
| 35         | .1668810            | .3153100            | 14685.23 | 206685.50  | 84         | .1178909            | .5971402            | 131.1871 | 395.4943  |
| 36         | .1409099            | .2852257            | 13832.80 | 192852.70  | 85         | 2.0136897           | .4658182            | 103.2023 | 292.2928  |
| 37         | .1148581            | .2548508            | 13027.41 | 179825.29  | 86         | 1.9024875           | .3269336            | 79.88909 | 212.29204 |
| 38         | .0887181            | .2241675            | 12266.43 | 167558.86  | 87         | .7838969            | .1803926            | 60.79907 | 151.49297 |
| 39         | .0624761            | .1931572            | 11547.18 | 156011.68  | 88         | .6560872            | 2.0261004           | 45.29885 | 106.19412 |
| 40         | .0361121            | .1618009            | 10867.06 | 145144.62  | 89         | .5208629            | 1.8634113           | 33.17898 | 73.01514  |
| 41         | 4.0096283           | .1300776            | 10224.18 | 134920.44  | 90         | .3764905            | .6921404            | 23.79527 | 49.21987  |
| 42         | 3.9829978           | .0979663            | 9616.074 | 125304.362 | 91         | .2228371            | .5120869            | 16.70464 | 32.51523  |
| 43         | .9562156            | .0654430            | 9040.982 | 116263.380 | 92         | 1.0596102           | .3231281            | 11.47124 | 21.04399  |
| 44         | .9292590            | 5.0324838           | 8496.870 | 107766.510 | 93         | 0.8861241           | 1.1254969           | 7.693503 | 13.350482 |
| 45         | .9021157            | 4.9990629           | 7982.073 | 99784.437  | 94         | .7028111            | 0.9193952           | 5.044419 | 8.306063  |
| 46         | .8747730            | .9651519            | 7495.024 | 92289.413  | 95         | .5094608            | .7053625            | 3.231922 | 5.074141  |
| 47         | .8472235            | .9307203            | 7034.343 | 85255.070  | 96         | .3062714            | .4842795            | 2.024284 | 3.049857  |
| 48         | .8194466            | .8957350            | 6598.521 | 78656.549  | 97         | 0.0938571           | .2573456            | 1.241244 | 1.808613  |
| 49         | .7914268            | .8601602            | 6186.241 | 72470.308  | 98         | 9.8728387           | 0.0263052           | .7461716 | 1.0624416 |
| 50         | .7631411            | .8239575            | 5796.170 | 66674.138  | 99         | .6504474            | 9.7890852           | .4471440 | .6152976  |
| 51         | .7345714            | .7870848            | 5427.145 | 61246.993  | 100        | .4251381            | .5430002            | .2661571 | .3491405  |
| 52         | .7056644            | .7494992            | 5077.669 | 56169.324  | 101        | 9.1821001           | .2945780            | .1520898 | .1970507  |
| 53         | .6763973            | .7111537            | 4746.760 | 51422.564  | 102        | 8.9526349           | 9.0309363           | .0896675 | .1073832  |
| 54         | .6467242            | .6719988            | 4433.270 | 46989.294  | 103        | .7205922            | 8.7390246           | .0525524 | .0548308  |
| 55         | .6166023            | .6319821            | 4136.207 | 42853.087  | 104        | .4952829            | 8.3719902           | .0312812 | .0235496  |
| 56         | .5859924            | .5910465            | 3854.716 | 38998.371  | 105        | 8.2522449           | 7.7539343           | .0178750 | .0056746  |
| 57         | .5548736            | .5491284            | 3588.175 | 35410.196  | 106        | 7.7539343           | ...                 | .0056746 | .0000000  |
| 58         | 3.5231614           | 4.5061624           | 3335.504 | 32074.692  |            |                     |                     |          |           |



TABLE 7.

*England and Wales.—Whole Population.—Single Lives.—Males.—Six per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$      | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|------------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.7469413           | 5.9009124           | 55839.47 | 795998.70  | 59         | 3.2479715           | 4.1862721           | 1769.993 | 15355.789 |
| 11         | .7181866            | .8714192            | 52262.07 | 743736.63  | 60         | .2108534            | .1376956            | 1625.000 | 13730.789 |
| 12         | .6898231            | .8418466            | 48957.94 | 694778.69  | 61         | .1729965            | .0878325            | 1489.349 | 12241.440 |
| 13         | .6617577            | .8121674            | 45894.19 | 648884.50  | 62         | .1342848            | 4.0365930           | 1362.338 | 10879.102 |
| 14         | .6338888            | .7823599            | 43041.64 | 605842.86  | 63         | .0946662            | 3.9838763           | 1243.558 | 9635.544  |
| 15         | .6060989            | .7524089            | 40373.73 | 565469.13  | 64         | .0540076            | .9295785            | 1132.420 | 8503.124  |
| 16         | .5782632            | .7223063            | 37867.20 | 527601.93  | 65         | 3.0122416           | .8735841            | 1028.589 | 7474.535  |
| 17         | .5502491            | .6920536            | 35501.70 | 492100.23  | 66         | 2.9692197           | .8157739            | 931.5803 | 6542.9548 |
| 18         | .5220443            | .6616527            | 33269.35 | 458830.88  | 67         | .9248929            | .7560095            | 841.1877 | 5701.7671 |
| 19         | .4936496            | .6311058            | 31163.74 | 427667.14  | 68         | .8790952            | .6941459            | 756.9988 | 4944.7683 |
| 20         | .4650797            | .6004146            | 29179.62 | 398487.52  | 69         | .8317546            | .6300156            | 678.8200 | 4265.9483 |
| 21         | .4363540            | .5695793            | 27312.03 | 371175.49  | 70         | .7826665            | .5634428            | 606.2706 | 3659.6777 |
| 22         | .4074929            | .5385983            | 25556.00 | 345619.49  | 71         | .7317118            | .4942277            | 539.1527 | 3120.5250 |
| 23         | .3785025            | .5074697            | 23905.76 | 321713.73  | 72         | .6786258            | .4221641            | 477.1180 | 2643.4070 |
| 24         | .3493750            | .4761919            | 22355.02 | 299358.71  | 73         | .6232587            | .3470166            | 420.0116 | 2223.3954 |
| 25         | .3201071            | .4447637            | 20898.11 | 278460.60  | 74         | .5652909            | .2685468            | 367.5284 | 1855.8670 |
| 26         | .2907147            | .4131824            | 19530.56 | 258930.04  | 75         | .5045794            | .1864724            | 319.5799 | 1536.2871 |
| 27         | .2612193            | .3814434            | 18248.17 | 240681.87  | 76         | .4406857            | .1005184            | 275.8581 | 1260.4290 |
| 28         | .2316334            | .3495406            | 17046.43 | 223635.44  | 77         | .3733781            | 3.0103746           | 236.2535 | 1024.1755 |
| 29         | .2019696            | .3174668            | 15920.98 | 207714.46  | 78         | .3021215            | 2.9157544           | 200.5033 | 823.6722  |
| 30         | .1722514            | .2852117            | 14867.96 | 192846.50  | 79         | .2265851            | .8163592            | 168.4943 | 655.1779  |
| 31         | .1424777            | .2527650            | 13882.82 | 178963.68  | 80         | .1462618            | .7119209            | 140.0431 | 515.1348  |
| 32         | .1126471            | .2201143            | 12961.25 | 166002.43  | 81         | 2.0610166           | .6021147            | 115.0844 | 400.0504  |
| 33         | .0827636            | .1872471            | 12099.39 | 153903.04  | 82         | 1.9703593           | .4866398            | 93.40267 | 306.64770 |
| 34         | .0528156            | .1541497            | 11293.17 | 142609.87  | 83         | .8741709            | .3651159            | 74.84640 | 231.80130 |
| 35         | 4.0228012           | .1208068            | 10539.04 | 132070.83  | 84         | .7720993            | .2371203            | 59.16969 | 172.63161 |
| 36         | 3.9927136           | .0872034            | 9833.624 | 122237.203 | 85         | .6637815            | 2.1021698           | 46.10855 | 126.52306 |
| 37         | .9625452            | .0533224            | 9173.714 | 113063.489 | 86         | .5484628            | 1.9598381           | 35.35598 | 91.16708  |
| 38         | .9322886            | 5.0191458           | 8556.351 | 104507.138 | 87         | .4257556            | .8096506            | 26.65358 | 64.51350  |
| 39         | .9019301            | 4.9846554           | 7978.663 | 96528.475  | 88         | .2938294            | .6516880            | 19.67119 | 44.84231  |
| 40         | .8714495            | .9498318            | 7437.885 | 89090.590  | 89         | .1544885            | .4852981            | 14.27212 | 30.57019  |
| 41         | .8408491            | .9146538            | 6931.855 | 82158.735  | 90         | 1.0059995           | .3102915            | 10.13910 | 20.43109  |
| 42         | .8101021            | .8790997            | 6458.060 | 75700.675  | 91         | 0.8482296           | 1.1264701           | 7.050658 | 13.380429 |
| 43         | .7792033            | .8431462            | 6014.553 | 69686.122  | 92         | .6808861            | 0.9337076           | 4.796077 | 8.584352  |
| 44         | .7481301            | .8067691            | 5599.253 | 64086.869  | 93         | .5032834            | .7322390            | 3.186276 | 5.398076  |
| 45         | .7168703            | .7699419            | 5210.391 | 58876.478  | 94         | .3158539            | .5222656            | 2.069445 | 3.328631  |
| 46         | .6854110            | .7326364            | 4846.307 | 54030.171  | 95         | 0.1183870           | .3043313            | 1.313370 | 2.015261  |
| 47         | .6537449            | .6948214            | 4505.520 | 49524.651  | 96         | 9.9110810           | 0.0793278           | .8148563 | 1.2004047 |
| 48         | .6218515            | .6564639            | 4186.504 | 45338.147  | 97         | .6945502            | 9.8484770           | .4949373 | .7054674  |
| 49         | .5897151            | .6175271            | 3887.900 | 41450.247  | 98         | .4694152            | .6135708            | .2947238 | .4107436  |
| 50         | .5573128            | .5779725            | 3608.384 | 37841.863  | 99         | .2429073            | .3725330            | .1749495 | .2357941  |
| 51         | .5246266            | .5377572            | 3346.776 | 34495.087  | 100        | 9.0134815           | 9.1226785           | .1031529 | .1326412  |
| 52         | .4916030            | .4968378            | 3101.723 | 31393.364  | 101        | 8.7663269           | 8.8707128           | .0583884 | .0742528  |
| 53         | .4582193            | .4551667            | 2872.230 | 28521.134  | 102        | .5327451            | .6037234            | .0340993 | .0401535  |
| 54         | .4244296            | .4126940            | 2657.233 | 25863.901  | 103        | .2965859            | 8.3087159           | .0197964 | .0203571  |
| 55         | .3901911            | .3693664            | 2455.789 | 23408.112  | 104        | 8.0671600           | 7.9387548           | .0116724 | .0086847  |
| 56         | .3554646            | .3251263            | 2267.068 | 21141.044  | 105        | 7.8200054           | 7.3175828           | .0066070 | .0020777  |
| 57         | .3202293            | .2799096            | 2090.400 | 19050.644  | 106        | 7.3175783           | ...                 | .0020777 | .0000000  |
| 58         | 3.2844005           | 4.2336503           | 1924.862 | 17125.782  |            |                     |                     |          |           |



TABLE 8.

*England and Wales.—Whole Population.—Single Lives.—Males.—Seven per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$      | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|------------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.7061622           | 5.8050606           | 50834.93 | 638352.36  | 59         | 3.0073747           | 3.9144555           | 1017.126 | 8212.1225 |
| 11         | .6733295            | .7717483            | 47133.47 | 591218.89  | 60         | 2.9661786           | .8625514            | 925.0785 | 7287.0440 |
| 12         | .6408882            | .7383665            | 43740.95 | 547477.94  | 61         | .9242439            | .8093652            | 839.9316 | 6447.1124 |
| 13         | .6087448            | .7048859            | 40620.46 | 506857.48  | 62         | .8814542            | .7548060            | 761.1219 | 5685.9905 |
| 14         | .5767980            | .6712818            | 37739.67 | 469117.81  | 63         | .8377577            | .6987721            | 688.2682 | 4997.7223 |
| 15         | .5449302            | .6375381            | 35069.55 | 434048.26  | 64         | .7930212            | .6411590            | 620.8993 | 4376.8230 |
| 16         | .5130166            | .6036458            | 32584.92 | 401463.34  | 65         | .7471773            | .5818502            | 558.6982 | 3818.1248 |
| 17         | .4809246            | .5696074            | 30263.88 | 371199.46  | 66         | .7000775            | .5207255            | 501.2768 | 3316.8480 |
| 18         | .4486419            | .5354248            | 28095.83 | 343103.63  | 67         | .6516728            | .4576459            | 448.4074 | 2868.4406 |
| 19         | .4161692            | .5011030            | 26071.69 | 317031.94  | 68         | .6017971            | .3924653            | 399.7579 | 2468.6827 |
| 20         | .3835214            | .4666426            | 24183.63 | 292848.31  | 69         | .5503786            | .3250146            | 355.1229 | 2113.5598 |
| 21         | .3507179            | .4320454            | 22424.25 | 270424.06  | 70         | .4972127            | .2551169            | 314.2047 | 1799.3551 |
| 22         | .3177788            | .3973102            | 20786.37 | 249637.69  | 71         | .4421800            | .1825704            | 276.8089 | 1522.5462 |
| 23         | .2847105            | .3624359            | 19262.40 | 230375.29  | 72         | .3850161            | .1071678            | 242.6700 | 1279.8762 |
| 24         | .2515051            | .3274218            | 17844.53 | 212530.76  | 73         | .3255711            | 3.0286725           | 211.6270 | 1068.2492 |
| 25         | .2181593            | .2922674            | 16525.68 | 196005.08  | 74         | .2635254            | 2.9468431           | 183.4533 | 884.7959  |
| 26         | .1846890            | .2569707            | 15299.92 | 180705.16  | 75         | .1987360            | .8613953            | 158.0287 | 726.7672  |
| 27         | .1511157            | .2215277            | 14161.71 | 166543.45  | 76         | .1307644            | .7720526            | 135.1340 | 591.6332  |
| 28         | .1174518            | .1859329            | 13105.44 | 153438.01  | 77         | 2.0593788           | .6785019            | 114.6513 | 476.98189 |
| 29         | .0837101            | .1501797            | 12125.79 | 141312.22  | 78         | 1.9840443           | .5804565            | 96.39273 | 380.58916 |
| 30         | .0499141            | .1142581            | 11217.97 | 130094.25  | 79         | .9044301            | .4776159            | 80.24724 | 300.58916 |
| 31         | 4.0160624           | .0781576            | 10376.78 | 119717.466 | 80         | .8200288            | .3697134            | 66.07373 | 234.26819 |
| 32         | 3.9821539           | .0418666            | 9597.407 | 110120.059 | 81         | .7307057            | .2564235            | 53.79052 | 180.47767 |
| 33         | .9481925            | 5.0053719           | 8875.493 | 101244.566 | 82         | .6359705            | .1374462            | 43.24842 | 137.22925 |
| 34         | .9141666            | 4.9686599           | 8206.663 | 93037.903  | 83         | .5357042            | 2.0124019           | 34.33240 | 102.89685 |
| 35         | .8800743            | .9317164            | 7587.074 | 85450.829  | 84         | .4295547            | 1.8808655           | 26.88776 | 76.00909  |
| 36         | .8459087            | .8945252            | 7013.078 | 78437.751  | 85         | .3171590            | .7423513            | 20.75668 | 55.25241  |
| 37         | .8116624            | .8570697            | 6481.304 | 71956.447  | 86         | .1977623            | .5964313            | 15.76748 | 39.48493  |
| 38         | .7773279            | .8193321            | 5988.636 | 65967.811  | 87         | 1.0709772           | .4426285            | 11.77544 | 27.709491 |
| 39         | .7428915            | .7812935            | 5532.119 | 60435.692  | 88         | 0.9349731           | .2810354            | 8.609405 | 19.100086 |
| 40         | .7083330            | .7429350            | 5108.966 | 55326.726  | 89         | .7915543            | 1.1109945           | 6.188057 | 12.912029 |
| 41         | .6736547            | .7042351            | 4716.879 | 50609.847  | 90         | .6389874            | 0.9323233           | 4.354993 | 8.557036  |
| 42         | .6388297            | .6651723            | 4353.412 | 46256.435  | 91         | .4771395            | .7448334            | 3.000126 | 5.556910  |
| 43         | .6038531            | .6257227            | 4016.550 | 42239.885  | 92         | .3057182            | .5484144            | 2.021707 | 3.535204  |
| 44         | .5687020            | .5858624            | 3704.265 | 38535.620  | 93         | 0.1240376           | .3433364            | 1.330569 | 2.2046335 |
| 45         | .5333642            | .5455647            | 3414.792 | 35120.828  | 94         | 9.9325301           | 0.1298580           | .8561110 | 1.3485225 |
| 46         | .4978270            | .5048015            | 3146.494 | 31974.334  | 95         | .7309853            | 9.9086303           | .5382516 | .8102709  |
| 47         | .4620830            | .4635413            | 2897.897 | 29076.437  | 96         | .5196014            | .6807375            | .3308274 | .4794435  |
| 48         | .4261117            | .4217501            | 2667.545 | 26408.892  | 97         | .2989927            | .4477462            | .1990640 | .2803795  |
| 49         | .3898974            | .3793918            | 2454.129 | 23954.763  | 98         | 9.0697798           | 9.2120525           | .1174302 | .1629493  |
| 50         | .3534172            | .3364269            | 2256.405 | 21698.358  | 99         | 8.8391940           | 8.9726402           | .0690548 | .0938945  |
| 51         | .3166530            | .2928119            | 2073.256 | 19625.102  | 100        | .6056902            | .7063653            | .0430358 | .0508587  |
| 52         | .2795516            | .2485032            | 1903.494 | 17721.608  | 101        | .3544578            | .4508724            | .0226182 | .0282405  |
| 53         | .2420900            | .2035523            | 1746.184 | 15975.424  | 102        | 8.1167981           | 8.1805502           | .0130857 | .0151548  |
| 54         | .2042223            | .1576094            | 1600.378 | 14375.046  | 103        | 7.8765609           | 7.8824619           | .0075259 | .0076289  |
| 55         | .1659059            | .1109203            | 1465.230 | 12909.816  | 104        | .6430571            | 7.5095923           | .0043960 | .0032329  |
| 56         | .1271015            | .0633271            | 1339.990 | 11569.826  | 105        | 7.3918246           | 6.8853196           | .0024650 | .0007679  |
| 57         | .0877883            | 4.0147646           | 1224.019 | 10345.807  | 106        | 6.8853196           | ...                 | .0007679 | .0000000  |
| 58         | 3.0478816           | 3.9651664           | 1116.559 | 9229.248   |            |                     |                     |          |           |



TABLE 9.

*England and Wales.—Whole Population.—Single Lives.—Males.—Eight per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|-----------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.6657624           | 5.7150797           | 46319.34 | 518895.25 | 59         | 2.7690160           | 3.6464515           | 587.5110 | 4430.4877 |
| 11         | .6288898            | .6779228            | 42549.04 | 476346.21 | 60         | .7237800            | .5911863            | 529.3952 | 3901.0925 |
| 12         | .5924084            | .6407053            | 39120.90 | 437225.31 | 61         | .6778052            | .5346448            | 476.2173 | 3424.8752 |
| 13         | .5562251            | .6033953            | 35993.58 | 401231.73 | 62         | .6309756            | .4767355            | 427.5389 | 2997.3363 |
| 14         | .5202383            | .5659663            | 33131.29 | 368100.44 | 63         | .5832391            | .4173556            | 383.0356 | 2614.3007 |
| 15         | .4843306            | .5284002            | 30502.16 | 337598.28 | 64         | .5344626            | .3564001            | 342.3439 | 2271.9568 |
| 16         | .4483769            | .4906881            | 28078.69 | 309519.59 | 65         | .4845787            | .2937516            | 305.1959 | 1966.7609 |
| 17         | .4122450            | .4528324            | 25837.18 | 283682.41 | 66         | .4334389            | .2292896            | 271.2932 | 1695.4677 |
| 18         | .3759223            | .4148369            | 23764.15 | 259918.26 | 67         | .3809943            | .1628734            | 240.4331 | 1455.0346 |
| 19         | .3394096            | .3767054            | 21847.90 | 238070.36 | 68         | .3270786            | .0943565            | 212.3629 | 1242.6717 |
| 20         | .3027219            | .3384412            | 20078.07 | 217992.29 | 69         | .2716202            | 3.0235681           | 186.9047 | 1055.7670 |
| 21         | .2658783            | .3000458            | 18444.99 | 199547.30 | 70         | .2144142            | 2.9503304           | 163.8379 | 891.9291  |
| 22         | .2288993            | .2615194            | 16939.45 | 182607.85 | 71         | .1553416            | .8744396            | 143.0018 | 748.9272  |
| 23         | .1917910            | .2228613            | 15552.17 | 167055.68 | 72         | .0941377            | .7956872            | 124.2047 | 624.7226  |
| 24         | .1545457            | .1840713            | 14274.00 | 152781.68 | 73         | 2.0306527           | .7138344            | 107.3131 | 517.4095  |
| 25         | .1171598            | .1451501            | 13096.63 | 139685.05 | 74         | 1.9645670           | .6286385            | 92.16520 | 425.24432 |
| 26         | .0796496            | .1060960            | 12012.95 | 127672.10 | 75         | .8957376            | .5398127            | 78.65703 | 346.58729 |
| 27         | .0420363            | .0669064            | 11016.31 | 116655.79 | 76         | .8237261            | .4470784            | 66.63863 | 279.94866 |
| 28         | 4.0043324           | 5.0275759           | 10100.26 | 106555.53 | 77         | .7483005            | .3501205            | 56.01450 | 223.93416 |
| 29         | 3.9665508           | 4.9880985           | 9258.717 | 97296.812 | 78         | .6689261            | .2486504            | 46.65800 | 177.27616 |
| 30         | .9287147            | .9484648            | 8486.228 | 88810.584 | 79         | .5852718            | .1423673            | 38.48326 | 138.79290 |
| 31         | .8908231            | .9086640            | 7777.197 | 81033.387 | 80         | .4968306            | 2.0310043           | 31.39284 | 107.40006 |
| 32         | .8528746            | .8686851            | 7126.472 | 73906.915 | 81         | .4034675            | 1.9142350           | 25.32052 | 82.07954  |
| 33         | .8148733            | .8285150            | 6529.400 | 67377.515 | 82         | .3046924            | .7917620            | 20.16937 | 61.91017  |
| 34         | .7768073            | .7881405            | 5981.462 | 61396.053 | 83         | .2003860            | .6632026            | 15.86303 | 46.04714  |
| 35         | .7386751            | .7475468            | 5478.669 | 55917.384 | 84         | 1.0901965           | .5281308            | 12.30825 | 33.73889  |
| 36         | .7004695            | .7067186            | 5017.293 | 50900.091 | 85         | 0.9737609           | .3860560            | 9.413712 | 24.325183 |
| 37         | .6621832            | .6656388            | 4593.918 | 46306.173 | 86         | .8503242            | .2365484            | 7.084746 | 17.240437 |
| 38         | .6238088            | .6242899            | 4205.414 | 42100.759 | 87         | .7194992            | 1.0791238           | 5.242026 | 11.998411 |
| 39         | .5853323            | .5826530            | 3848.861 | 38251.898 | 88         | .5794550            | 0.9138819           | 3.797126 | 8.201285  |
| 40         | .5467339            | .5407092            | 3521.551 | 34730.347 | 89         | .4319963            | .7401534            | 2.703935 | 5.497350  |
| 41         | .5080156            | .4984368            | 3221.185 | 31509.162 | 90         | .2753894            | .5577491            | 1.885338 | 3.612012  |
| 42         | .4691507            | .4558148            | 2945.444 | 28563.718 | 91         | 0.1095016           | .3664678            | 1.286772 | 2.325240  |
| 43         | .4301340            | .4128190            | 2692.366 | 25871.352 | 92         | 9.9340402           | 0.1661772           | .8590930 | 1.4661465 |
| 44         | .3909430            | .3694258            | 2460.045 | 23411.307 | 93         | .7483196            | 9.9571171           | .5601697 | .9059768  |
| 45         | .3515652            | .3256081            | 2246.804 | 21164.503 | 94         | .5527722            | .7394863            | .3570855 | .5488913  |
| 46         | .3119880            | .2813380            | 2051.104 | 19113.399 | 95         | .3471873            | .5138357            | .2224270 | .3264643  |
| 47         | .2722041            | .2365836            | 1871.562 | 17241.837 | 96         | 9.1317636           | .2810768            | .1354452 | .1910191  |
| 48         | .2321927            | .1913113            | 1706.840 | 15534.997 | 97         | 8.9071148           | 9.0424743           | .0807448 | .1102743  |
| 49         | .1919385            | .1454839            | 1555.746 | 13979.251 | 98         | .6738620            | 8.7999123           | .0471913 | .0630830  |
| 50         | .1514183            | .0990619            | 1417.159 | 12562.092 | 99         | .4392362            | .5513170            | .0274939 | .0355891  |
| 51         | .1106142            | .0520018            | 1290.073 | 11272.019 | 100        | 8.2016925           | .2939876            | .0159108 | .0196783  |
| 52         | .0694727            | 4.0042590           | 1173.472 | 10098.547 | 101        | 7.9464200           | 8.0349892           | .0088393 | .0108390  |
| 53         | 3.0279712           | 3.9557850           | 1066.525 | 9032.022  | 102        | .7047203            | 7.7613564           | .0050666 | .0057724  |
| 54         | 2.9860635           | .9065292            | 968.4194 | 8063.6028 | 103        | .4604432            | .4602060            | .0028870 | .0028854  |
| 55         | .9437071            | .8564373            | 878.4298 | 7185.1730 | 104        | 7.2228994           | 7.0844690           | .0016707 | .0012147  |
| 56         | .9008628            | .8054509            | 795.9079 | 6389.2651 | 105        | 6.9676270           | 6.4570819           | .0009282 | .0002865  |
| 57         | .8575095            | .7535043            | 720.2935 | 5668.9716 | 106        | 6.4570819           | ...                 | .0002865 | .0000000  |
| 58         | 2.8135629           | 3.7005306           | 650.9729 | 5017.9987 |            |                     |                     |          |           |



TABLE 10.

*England and Wales.—Whole Population.—Single Lives.—Males.—Nine per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|-----------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.6257350           | 5.6300960           | 42241.08 | 426673.79 | 59         | 2.5328542           | 3.3821015           | 341.0784 | 2410.4689 |
| 11         | .5848596            | .5890857            | 38446.74 | 388227.05 | 60         | .4836154            | .3234477            | 304.5197 | 2105.9492 |
| 12         | .5443755            | .5480236            | 35024.79 | 353202.26 | 61         | .4336379            | .2635260            | 271.4145 | 1834.5347 |
| 13         | .5041894            | .5068743            | 31929.30 | 321272.96 | 62         | .3828055            | .2022422            | 241.4379 | 1593.0968 |
| 14         | .4641999            | .4656095            | 29120.57 | 292152.39 | 63         | .3310663            | .1394934            | 214.3218 | 1378.7750 |
| 15         | .4242894            | .4242095            | 26563.75 | 265588.64 | 64         | .2782871            | .0751738            | 189.7960 | 1188.9790 |
| 16         | .3843330            | .3826649            | 24228.86 | 241359.78 | 65         | .2244004            | 3.0091661           | 167.6488 | 1021.3302 |
| 17         | .3441983            | .3409784            | 22090.13 | 219269.65 | 66         | .1692579            | 2.9413483           | 147.6583 | 873.6719  |
| 18         | .3038729            | .2991550            | 20131.35 | 199138.30 | 67         | .1128105            | .8715791            | 129.6614 | 744.0105  |
| 19         | .2633575            | .2571984            | 18338.24 | 180800.06 | 68         | 2.0548921           | .7997110            | 113.4728 | 630.5377  |
| 20         | .2226670            | .2151139            | 16698.10 | 164101.96 | 69         | 1.9954309           | .7255721            | 98.95344 | 531.58424 |
| 21         | .1818207            | .1729028            | 15199.19 | 148902.77 | 70         | .9342222            | .6489831            | 85.94532 | 445.63892 |
| 22         | .1408389            | .1305659            | 13830.53 | 135072.24 | 71         | .8711468            | .5697388            | 74.32703 | 371.31189 |
| 23         | .0997279            | .0881038            | 12581.37 | 122490.87 | 72         | .8059482            | .4876276            | 63.96586 | 307.34603 |
| 24         | .0584798            | .0455166            | 11441.41 | 111049.46 | 73         | .7384526            | .4024117            | 54.75864 | 252.58739 |
| 25         | 4.0170913           | 5.0028055           | 10401.39 | 100648.07 | 74         | .6683641            | .3138455            | 46.59766 | 205.98973 |
| 26         | 3.9755783           | 4.9599704           | 9453.188 | 91194.882 | 75         | .5955320            | .2216395            | 39.40324 | 166.58649 |
| 27         | .9339623            | .9170089            | 8589.390 | 82605.492 | 76         | .5195177            | .1255141            | 33.07636 | 133.51013 |
| 28         | .8922557            | .8739167            | 7802.894 | 74802.598 | 77         | .4400894            | 2.0251509           | 27.54796 | 105.96217 |
| 29         | .8504713            | .8306878            | 7087.144 | 67715.454 | 78         | .3567122            | 1.9202604           | 22.73590 | 83.22627  |
| 30         | .8086325            | .7873132            | 6436.244 | 61279.210 | 79         | .2690552            | .8105408            | 18.58040 | 64.64587  |
| 31         | .7667381            | .7437828            | 5844.375 | 55434.835 | 80         | .1766112            | .6957259            | 15.01797 | 49.62790  |
| 32         | .7247869            | .7000855            | 5306.240 | 50128.595 | 81         | 1.0792454           | .5754897            | 12.00177 | 37.62613  |
| 33         | .6827828            | .6562087            | 4817.068 | 45311.527 | 82         | 0.9764675           | .4495335            | 9.472563 | 28.153570 |
| 34         | .6407141            | .6121392            | 4372.341 | 40939.186 | 83         | .8681584            | .3174750            | 7.381734 | 20.771836 |
| 35         | .5985791            | .5678626            | 3968.068 | 36971.118 | 84         | .7539662            | .1788858            | 5.675004 | 15.096832 |
| 36         | .5563708            | .5233634            | 3600.567 | 33370.551 | 85         | .6335278            | 1.0332725           | 4.300587 | 10.796245 |
| 37         | .5140818            | .4786251            | 3266.494 | 30104.057 | 86         | .5060884            | 0.8802030           | 3.206922 | 7.589323  |
| 38         | .4717046            | .4336296            | 2962.815 | 27141.242 | 87         | .3712606            | .7191887            | 2.351043 | 5.238280  |
| 39         | .4292254            | .3883588            | 2686.738 | 24454.504 | 88         | .2272137            | .5503380            | 1.687383 | 3.550897  |
| 40         | .3866242            | .3427937            | 2435.703 | 22018.801 | 89         | 0.0757522           | .3729738            | 1.190562 | 2.360335  |
| 41         | .3439032            | .2969128            | 2207.512 | 19811.289 | 90         | 9.9151426           | 0.1869063           | .8225127 | 1.5378226 |
| 42         | .3010355            | .2506947            | 2000.025 | 17811.264 | 91         | .7452520            | 9.9919326           | .5562270 | .9815956  |
| 43         | .2580161            | .2041162            | 1811.408 | 15999.856 | 92         | .5657879            | .7879182            | .3679492 | .6136464  |
| 44         | .2148223            | .1571526            | 1639.919 | 14359.937 | 93         | .3760646            | .5751035            | .2377194 | .3759270  |
| 45         | .1714418            | .1097780            | 1484.027 | 12875.910 | 94         | 9.1765144           | .3536870            | .1501462 | .2257808  |
| 46         | .1278619            | .0619637            | 1342.338 | 11533.572 | 95         | 8.9669269           | 9.1242218           | .0926674 | .1331134  |
| 47         | .0840752            | 4.0136784           | 1213.599 | 10319.973 | 96         | .7475003            | 8.8876286           | .0559114 | .0772020  |
| 48         | 3.0400611           | 3.9648882           | 1096.633 | 9223.340  | 97         | .5188488            | .6451913            | .0330255 | .0441765  |
| 49         | 2.9958041           | .9155558            | 990.3851 | 8232.9552 | 98         | .2815932            | .3988407            | .0191246 | .0250519  |
| 50         | .9512812            | .8656411            | 893.8841 | 7339.0711 | 99         | 8.0429647           | 8.1465001           | .0110399 | .0140120  |
| 51         | .9064743            | .8151003            | 806.2585 | 6532.8126 | 100        | 7.8014182           | 7.8854630           | .0063302 | .0076818  |
| 52         | .8613301            | .7638887            | 726.6581 | 5806.1545 | 101        | .5421430            | .6229700            | .0034845 | .0041973  |
| 53         | .8158258            | .7119574            | 654.3737 | 5151.7808 | 102        | .2964406            | .3460203            | .0019790 | .0022183  |
| 54         | .7699154            | .6592555            | 588.7289 | 4563.0519 | 103        | 7.0481607           | 7.0417873           | .0011173 | .0011010  |
| 55         | .7235563            | .6057283            | 529.1226 | 4033.9293 | 104        | 6.8066142           | 6.6631353           | .0006406 | .0004604  |
| 56         | .6767092            | .5513172            | 475.0170 | 3558.9123 | 105        | .5473390            | 6.0327912           | .0003526 | .0001078  |
| 57         | .6293532            | .4959559            | 425.9447 | 3132.9676 | 106        | 6.0327912           | ...                 | .0001078 | .0000000  |
| 58         | 2.5814038           | 3.4395769           | 381.4203 | 2751.5473 |            |                     |                     |          |           |



TABLE 11.

*England and Wales.—Whole Population.—Single Lives.—Males.—Ten per Cent.*

| Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     | Age<br>$x$ | $\lambda \cdot D_x$ | $\lambda \cdot N_x$ | $D_x$    | $N_x$     |
|------------|---------------------|---------------------|----------|-----------|------------|---------------------|---------------------|----------|-----------|
| 10         | 4.5860731           | 5.5493964           | 38554.33 | 354320.62 | 59         | 2.2988492           | 3.1212584           | 198.9982 | 1322.0818 |
| 11         | .5412316            | .5045368            | 34772.16 | 319548.46 | 60         | .2456442            | 3.0591954           | 176.0533 | 1146.0285 |
| 12         | .4967813            | .4596325            | 31389.27 | 288159.19 | 61         | .1917005            | 2.9958717           | 155.4892 | 990.5393  |
| 13         | .4526290            | .4146461            | 28354.95 | 259804.24 | 62         | .1369019            | .9311944            | 137.0572 | 853.4821  |
| 14         | .4086733            | .3695473            | 25625.55 | 234178.69 | 63         | .0811965            | .8650590            | 120.5581 | 732.9240  |
| 15         | .3647966            | .3243145            | 23163.10 | 211015.59 | 64         | 2.0244511           | .7973593            | 105.7916 | 627.1324  |
| 16         | .3208740            | .2789375            | 20935.05 | 190080.54 | 65         | 1.9665983           | .7279763            | 92.59730 | 534.53512 |
| 17         | .2767732            | .2334201            | 18913.56 | 171166.98 | 66         | .9074896            | .6567885            | 80.81456 | 453.72056 |
| 18         | .2324816            | .1877666            | 17079.75 | 154087.23 | 67         | .8470760            | .5836532            | 70.31954 | 383.40102 |
| 19         | .1880000            | .1419831            | 15417.00 | 138670.23 | 68         | .7851914            | .5084227            | 60.98056 | 322.42046 |
| 20         | .1433433            | .0960744            | 13910.52 | 124759.71 | 69         | .7217640            | .4309231            | 52.69434 | 269.72612 |
| 21         | .0985308            | .0500432            | 12546.72 | 112212.99 | 70         | .6565891            | .3509742            | 45.35124 | 224.37488 |
| 22         | .0535828            | 5.0038908           | 11313.13 | 100899.86 | 71         | .5895476            | .2683694            | 38.86400 | 185.51088 |
| 23         | 4.0085056           | 4.9576173           | 10197.78 | 90702.08  | 72         | .5203748            | .1828972            | 33.14170 | 152.36918 |
| 24         | 3.9632914           | .9112247            | 9189.490 | 81512.594 | 73         | .4489209            | .0943149            | 28.11389 | 124.25529 |
| 25         | .9179366            | .8647151            | 8278.213 | 73234.381 | 74         | .3748662            | 2.0023774           | 23.70643 | 100.54886 |
| 26         | .8724574            | .8180887            | 7455.167 | 65779.214 | 75         | .2980679            | 1.9067918           | 19.86405 | 80.68481  |
| 27         | .8268752            | .7713438            | 6712.360 | 59066.854 | 76         | .2180874            | .8072770            | 16.52294 | 64.16187  |
| 28         | .7812024            | .7244770            | 6042.301 | 53024.553 | 77         | .1346929            | .7035123            | 13.63618 | 50.52569  |
| 29         | .7354518            | .6774828            | 5438.158 | 47586.395 | 78         | 1.0473496           | .5952070            | 11.15192 | 39.37377  |
| 30         | .6896468            | .6303525            | 4893.807 | 42692.588 | 79         | 0.9557264           | .4820580            | 9.030804 | 30.342963 |
| 31         | .6437863            | .5830764            | 4403.381 | 38289.207 | 80         | .8593162            | .3637999            | 7.232963 | 23.110000 |
| 32         | .5978689            | .5356437            | 3961.584 | 34327.623 | 81         | .7579842            | .2401059            | 5.727752 | 17.382248 |
| 33         | .5518986            | .4880420            | 3563.680 | 30763.943 | 82         | .6512401            | 1.1106786           | 4.479609 | 12.902639 |
| 34         | .5058637            | .4402584            | 3205.263 | 27558.680 | 83         | .5389648            | 0.9751342           | 3.459113 | 9.443526  |
| 35         | .4597625            | .3922787            | 2882.455 | 24676.225 | 84         | .4208064            | .8330432            | 2.635156 | 6.808370  |
| 36         | .4135880            | .3440878            | 2591.719 | 22084.506 | 85         | .2964019            | .6839085            | 1.978800 | 4.829570  |
| 37         | .3673328            | .2956689            | 2329.876 | 19754.630 | 86         | .1649963            | .5272953            | 1.462165 | 3.367405  |
| 38         | .3209895            | .2470047            | 2094.062 | 17660.568 | 87         | 0.0262023           | .3627112            | 1.062191 | 2.305214  |
| 39         | .2745441            | .1980767            | 1881.673 | 15778.895 | 88         | 9.8781892           | .1902737            | .7554212 | 1.5497929 |
| 40         | .2279767            | .1488660            | 1690.350 | 14088.545 | 89         | .7227615            | 0.0092971           | .5281551 | 1.0216378 |
| 41         | .1812895            | .0993519            | 1518.062 | 12570.483 | 90         | .5581857            | 9.8195923           | .3615644 | .6600734  |
| 42         | .1344556            | 4.0495130           | 1362.873 | 11207.610 | 91         | .3843290            | .6209550            | .2422863 | .4177871  |
| 43         | .0874700            | 3.9993258           | 1223.123 | 9984.487  | 92         | .2008987            | .4132487            | .1588176 | .2589695  |
| 44         | 3.0403101           | .9487663            | 1097.261 | 8887.226  | 93         | 9.0072092           | 9.1967168           | .1016738 | .1572957  |
| 45         | 2.9929634           | .8978084            | 983.9282 | 7903.2976 | 94         | 8.8036928           | 8.9715597           | .0636345 | .0936612  |
| 46         | .9454173            | .8464238            | 881.8958 | 7021.4018 | 95         | .5901391            | .7382675            | .0389259 | .0547353  |
| 47         | .8976644            | .7945811            | 790.0679 | 6231.3339 | 96         | .3667463            | .4978691            | .0232673 | .0314680  |
| 48         | .8496841            | .7422460            | 707.4310 | 5523.9029 | 97         | 8.1341286           | .2516261            | .0136185 | .0178495  |
| 49         | .8014609            | .6893817            | 633.0834 | 4890.8195 | 98         | 7.8929069           | 8.0015131           | .0078146 | .0100349  |
| 50         | .7529718            | .6359476            | 566.2025 | 4324.6170 | 99         | .6503122            | 7.7454574           | .0044700 | .0055649  |
| 51         | .7041988            | .5818997            | 506.0563 | 3818.5607 | 100        | .4047995            | .4807397            | .0025398 | .0030251  |
| 52         | .6550884            | .5271932            | 451.9479 | 3366.6128 | 101        | 7.1415581           | 7.2147909           | .0013853 | .0016398  |
| 53         | .6056179            | .4717788            | 403.2904 | 2963.3224 | 102        | 6.8918895           | 6.9345994           | .0007796 | .0008602  |
| 54         | .5557413            | .4156054            | 359.5351 | 2603.7873 | 103        | .6396434            | .6273659            | .0004362 | .0004240  |
| 55         | .5054160            | .3586183            | 320.1960 | 2283.5913 | 104        | .3941307            | 6.2460059           | .0002478 | .0001762  |
| 56         | .4546028            | .3007585            | 284.8412 | 1998.7501 | 105        | 6.1308894           | 5.6123754           | .0001352 | .0000410  |
| 57         | .4032806            | .2419589            | 253.0932 | 1745.6569 | 106        | 5.6123754           | ...                 | .0000410 | .0000000  |
| 58         | 2.3513650           | 3.1821521           | 224.5769 | 1521.0800 |            |                     |                     |          |           |



In pp. 532 *ante*, were given the formulæ employed in the construction of the auxiliary Tables 2 to 11 inclusive, and with but slight modifications the same are applicable to the formation of Tables on joint lives. It may, however, be convenient for many purposes to give the formulæ more in detail, by which the following Tables were formed. The rate of interest at which they are calculated, it will be observed, is seven per cent. The reason for adopting this rate is, that there are frequently contingent life interests and reversions disposed of, the market price of which is regulated by as high a rate of interest, and there being no published Tables on joint lives calculated at a higher rate than six per cent., it is believed that the following Tables will be found useful, not only in regard to such matters, but in respect to many other questions of a more general and public nature. Whenever occasion may arise for the determination of the value of contingent life interests at other rates of interest, such may be done from the following Tables by a simple mode of approximation, the formula for which is hereafter given, and its application may be safely relied on for all practical purposes.

The following, viewed in connection with the explanations already furnished in pp. 532-3 *ante*, will shew the conditions and formulæ on which the construction of the following auxiliary Tables on joint lives depends:—

Let  $l_x$  = Number living at age  $x$  in the second column of Table C (Males), pp. 5-6 *ante*, and

$l_y$  = Number living at age  $y$  in the same Table; also

$p_{x,y}$  = Probability of the joint survivorship of two lives aged  $x$  and  $y$  for one year; and likewise

$r$  = 0.07, seven per cent. being the rate of interest adopted in the calculation of the following Tables.

$1+r$  = 1.07,  $\lambda.(1+r) = 0.02938378$ , and therefore  $\frac{1}{2}\lambda.(1+r) = 0.01469189$ .

$v = \frac{1}{1+r} = .9345794 \quad 39252$  being the present value of £1 due one year hence, consequently

$\lambda.v = 9.9706162$ , and therefore  $\lambda.\sqrt{v} = \frac{1}{2}\lambda.v = \frac{1}{2}\lambda.\left(\frac{1}{1.07}\right) = 9.9853081 \quad 1157$ .

$v^{\frac{1}{2}} = \frac{1}{1+\frac{r}{2}} = \frac{1}{1.035} = .9661835 \quad 65217$  being the present value of £1 due six months hence, and therefore

$\lambda.v^{\frac{1}{2}} = \left(\frac{1}{1+\frac{r}{2}}\right) = \lambda.\left(\frac{1}{1.035}\right) = \lambda'.1.035 = 9.9850596 \quad 50207$ , which is not to be confounded with  $\frac{1}{2}\lambda.v$ , the quantity employed in the determination of the vertical series hereafter referred to.

Then in the following Auxiliary Tables will

$$(1) \quad D_{x,y} = l_x.l_y.v^{\frac{1}{2}(x+y)} = l_{x,y}.v^{\frac{1}{2}(x+y)}$$

$$D_{x,y+1} = l_{x,y+1}.v^{\frac{1}{2}(x+y+1)} \quad \text{and therefore}$$

$$\frac{D_{x,y}}{D_{x,y+1}} = \frac{1}{\sqrt{v}.p_y} \quad \text{and}$$

$$(2) \quad \lambda.D_{x,y} = \lambda.D_{x,y+1} + \lambda'.\sqrt{v}.p_y = \lambda.D_{x,y+1} + \lambda'.p_y + \frac{1}{2}\lambda.(1+r)$$



Again  $\lambda.D_{x,y+1} = \lambda.D_{x,y} + \Delta\lambda.D_{x,y}$ , but

$$\Delta\lambda.D_{x,y} = \lambda.p_y + \frac{1}{2}\lambda.v, \quad \text{and therefore}$$

$$(3) \quad \lambda.D_{x,y+1} = \lambda.D_{x,y} + \lambda.p_y + \frac{1}{2}\lambda.v, \quad \text{or}$$

$$(4) \quad \lambda.D_{x,y+1} = \lambda.D_{x,y} - (\lambda'.p_y + \frac{1}{2}\lambda'.v), \quad \text{and also}$$

$$(5) \quad \lambda.D_{x,y+1} = \lambda.D_{x,y} - (\lambda'.p_y - \frac{1}{2}\lambda.v). \quad \text{On referring to page 532 } \textit{ante}, \text{ it will be seen that}$$

$$\lambda.p_{x,y} = \lambda.p_x + \lambda.p_y, \quad \text{and also}$$

$$\Delta\lambda.p_{x,y} = \Delta\lambda.p_y, \quad x \text{ in the series being constant, therefore}$$

$$\lambda.p_{x,y+1} = \lambda.p_{x,y} + \lambda.p_y.$$

In the above formulæ it is assumed in the determination of the successive differences that one of the ages,  $x$ , remains constant and the other,  $y$ , is by each step in the manipulation varied one year, and as applied to Table 13 will always vary vertically. In the practical construction of such Tables as the following there are many reasons in favour of such a mode of calculation, from its less liability to manual errors, but the same principles may be applied in the formation of Tables by a continuous series in which the result of each step in the order of differences will determine the values for a variation of one year in the age of each of the two lives, as follows, and as applied to Table 13 will vary horizontally.

$$(6) \quad \lambda.D_{(x,y)+1} = \lambda.D_{x,y} + \lambda.v.p_{x,y}, \quad \text{or}$$

$$(7) \quad \lambda.D_{(x,y)+1} = \lambda.D_{x,y} + \lambda.v.p_x + \lambda.p_y \quad \text{and}$$

$$(8) \quad \lambda.D_{(x,y)+1} = \lambda.D_{x,y} + \lambda.p_x + \lambda.p_y + \lambda.v; \quad \text{in like manner}$$

$$(9) \quad \lambda.D_{x,y} = \lambda.D_{(x,y)+1} + \lambda'.v.p_{x,y}, \quad \text{or}$$

$$(10) \quad \lambda.D_{x,y} = \lambda.D_{(x,y)+1} + \lambda'.v.p_x + \lambda'.p_y \quad \text{and also}$$

$$(11) \quad \lambda.D_{x,y} = \lambda.D_{(x,y)+1} + \lambda'.p_x + \lambda'.p_y + \lambda'.v.$$

The preceding formulæ furnish various modes by which to construct auxiliary Tables according to the continuous method of calculation. The most convenient formula will depend on the nature and extent of the preliminary Tables which may have been prepared for facilitating the final calculation in which the value of  $\lambda.D_{x,y}$  is to be determined. In the preliminary Table 12, page 546 *ante*, will be found all the elements which enter into the above formulæ, and should no further combination of them be made there can be very little difference between the facilities in calculation offered by the expressions (2) to (5) inclusive. Each of the series of results, it will be seen, is produced by the successive additions or subtractions from the initial  $\lambda.D_{x,y}$ , with which the series begins, of two other quantities, but if these two quantities were combined the subsequent process of calculation would be shortened, and the values determined, by the continued addition or subtraction of only one quantity. The following preliminary Table contains the elements so combined according to the preceding methods of finding the successive values of  $\lambda.D_{x,y}$ .



TABLE 12.

*Being preliminary to the construction of Tables 13 and 14.*

| Age. | $\lambda'.p_y + \frac{1}{2}\lambda.(1+r)$ | $\lambda.p_y + \frac{1}{2}\lambda.v$ | $\lambda'.p_y + \frac{1}{2}\lambda'.v$<br>=<br>$\lambda'.p_y - \frac{1}{2}\lambda.v$ | AGE 10.            |                                        |                     |                                          |
|------|-------------------------------------------|--------------------------------------|--------------------------------------------------------------------------------------|--------------------|----------------------------------------|---------------------|------------------------------------------|
|      |                                           |                                      |                                                                                      | $\lambda.vp_{x,y}$ | $\lambda.vp_x$<br>or<br>$\lambda.yp_y$ | $\lambda'.vp_{x,y}$ | $\lambda'.vp_x$<br>or<br>$\lambda'.vp_y$ |
|      | (2)                                       | (3)                                  | (4) & (5)                                                                            | (6)                | (7)                                    | (9)                 | (10)                                     |
| 10   | 0.0181408                                 | 9.9818592                            | 0.0181408                                                                            | 9.9637184          | 9.9671673                              | 0.0362816           | 0.0328327                                |
| 11   | .0177495                                  | .9822505                             | .0177495                                                                             | .9641097           | .9675586                               | .0358903            | .0324414                                 |
| 12   | .0174515                                  | .9825485                             | .0174515                                                                             | .9744077           | .9678566                               | .0255923            | .0321434                                 |
| 13   | .0172549                                  | .9827451                             | .0172549                                                                             | .9646043           | .9680532                               | .0353957            | .0319468                                 |
| 14   | .0171759                                  | .9828241                             | .0171759                                                                             | .9646833           | .9681322                               | .0353167            | .0318678                                 |
| 15   | .0172218                                  | .9827782                             | .0172218                                                                             | .9646374           | .9680863                               | .0353626            | .0319137                                 |
| 16   | .0174091                                  | .9825999                             | .0174001                                                                             | .9644591           | .9679080                               | .0355409            | .0320920                                 |
| 17   | .0175908                                  | .9824092                             | .0175908                                                                             | .9642684           | .9677173                               | .0357316            | .0322827                                 |
| 18   | .0177808                                  | .9822192                             | .0177808                                                                             | .9640784           | .9675273                               | .0359216            | .0324727                                 |
| 19   | .0179559                                  | .9820441                             | .0179559                                                                             | .9639033           | .9673522                               | .0360967            | .0326478                                 |
| 20   | .0181117                                  | .9818883                             | .0181117                                                                             | .9637475           | .9671964                               | .0362525            | .0328036                                 |
| 21   | .0182472                                  | .9817528                             | .0182472                                                                             | .9636120           | .9670609                               | .0363880            | .0329391                                 |
| 22   | .0183764                                  | .9816236                             | .0183764                                                                             | .9634828           | .9669317                               | .0365172            | .0330683                                 |
| 23   | .0185135                                  | .9814865                             | .0185135                                                                             | .9633457           | .9667946                               | .0366543            | .0332054                                 |
| 24   | .0186540                                  | .9813460                             | .0186540                                                                             | .9632052           | .9666541                               | .0367048            | .0333459                                 |
| 25   | .0187784                                  | .9812216                             | .0187784                                                                             | .9630808           | .9665297                               | .0369192            | .0334703                                 |
| 26   | .0188814                                  | .9811186                             | .0188814                                                                             | .9629778           | .9664267                               | .0370222            | .0335733                                 |
| 27   | .0189720                                  | .9810280                             | .0189720                                                                             | .9628872           | .9663361                               | .0371128            | .0336639                                 |
| 28   | .0190498                                  | .9809502                             | .0190498                                                                             | .9628094           | .9662583                               | .0371906            | .0337417                                 |
| 29   | .0191042                                  | .9808958                             | .0191042                                                                             | .9627550           | .9662039                               | .0372450            | .0337961                                 |
| 30   | .0191598                                  | .9808402                             | .0191598                                                                             | .9626994           | .9661483                               | .0373006            | .0338517                                 |
| 31   | .0192166                                  | .9807834                             | .0192166                                                                             | .9626426           | .9660915                               | .0373574            | .0339085                                 |
| 32   | .0192695                                  | .9807305                             | .0192695                                                                             | .9625897           | .9660386                               | .0374103            | .0339614                                 |
| 33   | .0193341                                  | .9806659                             | .0193341                                                                             | .9625251           | .9659740                               | .0374749            | .0340260                                 |
| 34   | .0194004                                  | .9805996                             | .0194004                                                                             | .9624588           | .9659077                               | .0375412            | .0340923                                 |
| 35   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 36   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 37   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 38   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 39   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 40   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 41   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 42   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 43   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 44   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 45   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 46   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 47   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 48   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 49   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 50   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 51   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 52   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 53   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 54   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 55   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 56   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 57   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 58   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 59   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 60   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 61   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 62   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 63   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 64   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 65   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 66   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 67   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 68   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 69   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 70   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 71   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 72   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 73   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 74   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 75   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 76   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 77   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 78   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 79   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 80   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 81   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 82   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 83   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 84   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 85   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 86   |                                           |                                      |                                                                                      |                    |                                        |                     |                                          |
| 87   | .1213123                                  | .8786877                             | .1213123                                                                             | .8605469           | .8639958                               | .1394531            | .1360042                                 |
| 88   | .1287269                                  | .8712731                             | .1287269                                                                             | .8531323           | .8565812                               | .1468677            | .1434188                                 |
| 89   | .1378750                                  | .8621250                             | .1378750                                                                             | .8439842           | .8474331                               | .1560158            | .1525669                                 |
| 90   | .1471560                                  | .8528440                             | .1471560                                                                             | .8347032           | .8381521                               | .1652968            | .1618479                                 |
| 91   | .1567295                                  | .8432705                             | .1567295                                                                             | .8251297           | .8285786                               | .1748703            | .1714214                                 |
| 92   | .1669887                                  | .8330113                             | .1669887                                                                             | .8148705           | .8183194                               | .1851295            | .1816806                                 |
| 93   | .1768156                                  | .8231844                             | .1768156                                                                             | .8050436           | .8084925                               | .1949564            | .1915075                                 |
| 94   | .1868529                                  | .8131471                             | .1868529                                                                             | .7950063           | .7984552                               | .2049937            | .2015448                                 |
| 95   | .1966920                                  | .8033080                             | .1966920                                                                             | .7851672           | .7886161                               | .2148328            | .2113839                                 |
| 96   | .2059169                                  | .7940831                             | .2059169                                                                             | .7759423           | .7793912                               | .2240577            | .2206088                                 |
| 97   | .2145210                                  | .7854790                             | .2145210                                                                             | .7673382           | .7707871                               | .2326618            | .2292129                                 |
| 98   | .2158930                                  | .7841061                             | .2158939                                                                             | .7659653           | .7694142                               | .2340347            | .2305858                                 |
| 99   | .2188119                                  | .7811881                             | .2188119                                                                             | .7630473           | .7664962                               | .2369527            | .2335038                                 |
| 100  | .2365406                                  | .7634594                             | .2365406                                                                             | .7453186           | .7487675                               | .2546814            | .2512325                                 |
| 101  | .2229678                                  | .7770322                             | .2229678                                                                             | .7588914           | .7623403                               | .2411086            | .2376597                                 |
| 102  | .2255453                                  | .7744547                             | .2255453                                                                             | .7563139           | .7597628                               | .2436861            | .2402372                                 |
| 103  | .2188119                                  | .7811881                             | .2188119                                                                             | .7630473           | .7664962                               | .2369527            | .2335038                                 |
| 104  | .2365406                                  | .7634594                             | .2365406                                                                             | .7543186           | .7487675                               | .2546814            | .2512325                                 |
| 105  | 0.4918132                                 | 9.5081868                            | 0.4918132                                                                            | 9.4900460          | 9.4934949                              | 0.5099540           | 0.5065051                                |



In columns (4) (5) of the preceding Table will be found the vertical differences by which the whole of the Tables, of which Table **13** is a specimen, were calculated. The successive values of the expression  $\lambda.p_y - \frac{1}{2}\lambda.v$  for each age, were written on a perforated slip of paper, and the initial  $\lambda.D_{x,y}$ , or the first at the top of each column in Table **13** having been determined from  $D_{x,y} = l_{x,y} \cdot v^{\frac{1}{2}(x+y)}$ , the subsequent values of  $\lambda.D_{x,y}$  in each column were produced by deducting the corresponding quantities to the given difference of age on the perforated slip. The same slip of course served for the whole range of the Table, whatever the disparity of age. For example, if from the initial  $\lambda.D_{x,y} = 4.7061622$  in the first column headed "Age" 10, Table **13**, there be, in succession, deducted the quantities in the same order given in column (4), (5) of the preceding Table **12**, the results will be found to produce the successive values in Table **13**, in that column, and the figures, in the same perforated slip, if deducted from the initial quantity in column "Age" 11, beginning also with age 11 on the slip, will, in succession, produce all the results in that column, and so, in like manner, will the results in all the other columns of Table **13** be produced. One of the advantages, independent of the reduced amount of labour of the present over the direct method of calculation followed in constructing the Tables in pp. 148 and 494 *ante* is, that if at any step of the process an error should be made, it must affect all the subsequent results, and, therefore, the correctness of any one series of the Tables may be easily tested by calculating, at an advanced stage of it, the value of  $\lambda.D_{x,y}$  by the direct method. Thus,  $\lambda.D_{x,y}$  in column "Age" 10, for disparity of 90 years, or for ages 10-100, is found directly from the expression  $l_{x,y} \cdot v^{\frac{1}{2}(x+y)}$ .

|                   |                                |                                                      |     |                  |
|-------------------|--------------------------------|------------------------------------------------------|-----|------------------|
| In Table <b>1</b> | $\lambda.l_x$                  | $= \lambda.l_{10}$                                   | $=$ | 5.0000000        |
| ...               | $\lambda.l_y$                  | $= \lambda.l_{100}$                                  | $=$ | 1.5440680        |
| ...               | $\lambda.v^{\frac{1}{2}(x+y)}$ | $= \lambda.v^{\frac{1}{2}(10+100)} = \lambda.v^{55}$ | $=$ | 8.3838922        |
| ...               | $\lambda.D_{x,y}$              | $= \lambda.D_{10,100}$                               | $=$ | 4.9279602, which |

agrees with the results of Table **13**, only that the index in that Table has been reduced by 5, in order to condense the figures in the final Table **14**. It is therefore to be presumed that all the results in the same column are correct. It is possible, however, that compensating errors may have arisen, but the chances of errors which shall exactly balance each other are very remote, but, to guard against such a contingency, it is prudent to check the results by performing the direct calculation at four or five intervals throughout the column, or, what is still a better test, would be to go over the whole of the figures in the column with a second perforated slip, prepared in accordance with formula (3), as given in column (3) Table **12**, in which the expression  $\lambda.p_y + \frac{1}{2}\lambda.v$  is additive, while that actually employed in the original construction of the Table was subtractive. This, carefully done, will always ensure complete accuracy.



TABLE 13.

*(The characteristic in each of the quantities  $\lambda.D_{x,y}$  has been diminished by 5.)*

| $y-x$ | 10                | 11                | 12                | 13                | 14                | 15                | 16                |
|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| $y-x$ | $\lambda.D_{x,y}$ | $\lambda.D_{x,y}$ | $\lambda.D_{x,y}$ | $\lambda.D_{x,y}$ | $\lambda.D_{x,y}$ | $\lambda.D_{x,y}$ | $\lambda.D_{x,y}$ |
| 0     | 4.7061622         | 4.6698806         | 4.6343817         | 4.5994787         | 4.5649689         | 4.5306171         | 4.4961736         |
| 1     | .6880214          | .6521312          | .6169302          | .5822238          | .5477930          | .5133953          | .4787735          |
| 2     | .6702719          | .6346797          | .5996753          | .5650479          | .5305712          | .4959953          | .4611827          |
| 3     | .6528205          | .6174248          | .5824994          | .5478261          | .5131711          | .4784045          | .4434019          |
| 4     | .6355656          | .6002489          | .5652776          | .5304260          | .4955804          | .4606237          | .4254460          |
| 5     | .6183897          | .5830271          | .5478775          | .5128352          | .4777996          | .4426678          | .4073343          |
| 6     | .6011679          | .5656270          | .5302867          | .4950545          | .4598437          | .4245561          | .3890871          |
| 7     | .5837678          | .5480362          | .5125059          | .4770986          | .4417320          | .4063089          | .3707107          |
| 8     | .5661770          | .5302554          | .4945501          | .4589869          | .4234848          | .3879325          | .3521972          |
| 9     | .5483962          | .5122995          | .4764384          | .4407397          | .4051084          | .3694190          | .3335433          |
| 10    | .5304403          | .4941879          | .4581912          | .4223633          | .3865949          | .3507650          | .3147649          |
| 11    | .5123286          | .4759407          | .4398148          | .4038498          | .3679409          | .3319867          | .2958835          |
| 12    | .4940815          | .4575643          | .4213013          | .3851958          | .3491625          | .3131053          | .2769115          |
| 13    | .4757051          | .4390508          | .4026473          | .3664174          | .3302812          | .2941333          | .2578617          |
| 14    | .4571916          | .4203968          | .3838689          | .3475360          | .3113092          | .2750835          | .2387575          |
| 15    | .4385376          | .4016184          | .3649875          | .3285641          | .2922594          | .2559793          | .2195977          |
| 16    | .4197592          | .3827370          | .3460155          | .3095143          | .2731552          | .2368195          | .2003811          |
| 17    | .4008778          | .3637650          | .3269658          | .2904101          | .2539954          | .2176029          | .1811116          |
| 18    | .3819058          | .3447152          | .3078616          | .2712503          | .2347788          | .1983334          | .1617776          |
| 19    | .3628560          | .3256111          | .2887018          | .2520337          | .2155093          | .1789993          | .1423772          |
| 20    | .3437518          | .3064513          | .2694852          | .2327642          | .1961752          | .1595990          | .1229035          |
| 21    | .3245921          | .2872347          | .2502157          | .2134301          | .1767748          | .1401253          | .1033491          |
| 22    | .3053755          | .2679652          | .2308816          | .1940297          | .1573012          | .1205709          | .0837065          |
| 23    | .2861060          | .2486311          | .2114812          | .1745560          | .1377468          | .1009283          | .0639619          |
| 24    | 4.2667719         | 4.2292307         | 4.1920075         | 4.1550017         | 4.1181042         | 4.0811837         | 4.0440953         |
| 74    | 2.5167544         | 2.4009099         | 2.2784496         | 2.1489109         | 2.0103437         | 1.8644410         | 1.7093442         |
| 75    | .4190507          | .2962051          | .1663564          | .2.0275986        | 1.8816168         | .7265660          | .5621882          |
| 76    | .3143459          | .1841119          | .2.0450441        | 1.8988717         | .7437419          | .5794100          | .4054587          |
| 77    | .2022527          | .2.0627996        | 1.9163172         | .7609967          | .5965859          | .4226805          | .2384700          |
| 78    | .2.0809404        | 1.9340727         | .7784422          | .6138408          | .4398564          | .2556918          | 1.0616544         |
| 79    | 1.9522135         | .7961977          | .6312862          | .4571113          | .2728677          | 1.0788762         | 0.8748015         |
| 80    | .8143385          | .6490417          | .4745568          | .2901226          | 1.0960521         | 0.8920233         | .6781095          |
| 81    | .6671825          | .4923122          | .3075681          | 1.1133070         | 0.9091992         | .6953313          | .4721927          |
| 82    | .5104530          | .3253236          | 1.1307525         | 0.9264541         | .7125072          | .4894144          | .2576717          |
| 83    | .3434643          | 1.1485080         | 0.9438996         | .7297621          | .5065903          | .2748935          | 0.0417778         |
| 84    | 1.1666488         | 0.9616551         | .7472076          | .5238452          | .2920693          | 0.0589996         | 9.8229659         |
| 85    | 0.9797959         | .7649631          | .5412907          | .3093242          | 0.0761755         | 9.8401877         | .5864253          |
| 86    | .7831039          | .5590462          | .3267697          | 0.0934303         | 9.8573636         | .6036471          | .3634575          |
| 87    | .5771870          | .3445252          | 0.1108758         | 9.8746185         | .6208230          | .3806793          | 9.1379122         |
| 88    | .3626660          | 0.1286313         | 9.8920639         | .6380779          | .3978552          | 9.1551340         | 8.9191003         |
| 89    | 0.1467721         | 9.9098194         | .6555234          | .4151101          | 9.1723099         | 8.9363221         | .6825597          |
| 90    | 9.9279602         | .6732788          | .4325556          | 9.1895648         | 8.9534980         | .6997815          | 8.1907466         |
| 91    | .6914196          | .4503111          | 9.2070103         | 8.9707529         | .7169574          | 8.2079683         |                   |
| 92    | .4684518          | .2247658          | 8.9881984         | .7342123          | 8.2251442         |                   |                   |
| 93    | .2429066          | 9.0059539         | .7516578          | 8.2423991         |                   |                   |                   |
| 94    | 9.0240947         | 8.7694133         | 8.2598446         |                   |                   |                   |                   |
| 95    | 8.7875541         | 8.2776001         |                   |                   |                   |                   |                   |
| 96    | 8.2957409         |                   |                   |                   |                   |                   |                   |



An attentive examination of the preceding formulæ, and the construction of Tables **12** and **13**, will suggest a variety of means by which tests may be applied to ensure the correctness of the quantities  $\lambda.D_{x,y}$  in the latter Table. One which will be found very simple and convenient is in the application of  $\lambda.p_x + \frac{1}{2}\lambda.v$ , and which is tabulated in column (3) Table **12**, as  $\lambda.p_y + \frac{1}{2}\lambda.v$ ,  $x$  in the series now under consideration being constant, and taking the place of  $y$  in that column. If then  $\lambda.p_x + \frac{1}{2}\lambda.v$  be continuously added to the results in any one column of Table **13**, it will always produce the  $\lambda.D_{x,y}$  in the next column, one place higher in order; for example,  $\lambda.p_{10} + \frac{1}{2}\lambda.v = 9.9818592$  if added to any quantity in column "Age" 10, Table **13**, will produce  $\lambda.D_{x,y}$  in column "Age" 11, but one place higher in order. In like manner will  $\lambda.p_{15} + \frac{1}{2}\lambda.v = 9.9827782$ , if added to the figures in column "Age" 15, produce the results in column "Age" 16, but one place higher in order.

The whole of the series of Tables, of which Table **13** is a specimen, having been calculated according to the formulæ already pointed out, and various modes of verification employed to test the accuracy of the results, the next step was to find the natural numbers of  $\lambda.D_{x,y}$ . This having been done, the values of  $\lambda.D_{x,y}$ , taken horizontally from Table **13**, were arranged vertically, in the same order, in Table **14**, and will be found in the various columns headed  $D_{x,y}$  in that Table. The whole of the enlarged Table **14** being so far completed, the adjacent column in the same Table was formed from the expression

$$N_{x,y} = \Sigma D_{x,y}$$

In this manner has Table **14** been constructed, and all the results verified throughout.

In calculating the Auxiliary Tables, in pp. 148 and 494 *ante*, by the direct method, the use of logarithms, to five decimal places, would have been sufficient for all practical purposes, but by the continuous method followed in the construction of Tables **1** to **14** inclusive, where the results are determined by successive additions of constant quantities to an initial value, any original inaccuracy in these constants is increased at each step, and becomes magnified to a great extent at the end of the series. Extreme care is therefore necessary in the formation of the preliminary Table **12**, page 546, and particularly in regard to the constants  $\lambda.(1+r)$ ,  $\frac{1}{2}\lambda.v$ ,  $\frac{1}{2}\lambda'.v$  and  $\lambda'.v$ , all of which may be derived from  $\lambda.v$ . In page 532 *ante* will be found, for ten different rates of interest, the  $\lambda.v$  to twelve places of decimals calculated with the Logarithms in the large edition of Vega, and will meet most cases which are likely to arise, but should the  $\lambda.v$  for intermediate rates of interest, or for higher or lower rates than those given in page 532 be required, they may be found in a few minutes by those not having at hand Tables of Logarithms to more than seven places, by the following formula. As the same necessity exists for accuracy in the use of the  $\lambda.v^x$ , given in the eighth column of Table **1**, page 533, a complete Table of the  $\lambda.v^x$ , from  $\lambda.v_1$ , to  $\lambda.v_{110}$ , for ten different rates of interest and to twelve places of decimals, will be found in a Table in the subsequent pages of this Contribution.



TABLE 14.

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 0 YEAR. |      |           |           |                              |      |           |           | DIFFERENCE OF AGE 1 YEAR. |      |           |           |                              |      |           |           |
|----------------------------|------|-----------|-----------|------------------------------|------|-----------|-----------|---------------------------|------|-----------|-----------|------------------------------|------|-----------|-----------|
| Ages.                      |      | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |      | $D_{x,y}$ | $N_{x,y}$ | Ages.                     |      | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |      | $D_{x,y}$ | $N_{x,y}$ |
| $x.$                       | $y.$ |           |           | $x.$                         | $y.$ |           |           | $x.$                      | $y.$ |           |           | $x.$                         | $y.$ |           |           |
| 10                         | 10   | 50835     | 627817    | 61                           | 61   | 437.42    | 2956.38   | 10                        | 11   | 48755     | 601852    | 61                           | 62   | 410.02    | 2728.37   |
| 11                         | 11   | 46761     | 576982    | 62                           | 62   | 384.33    | 2518.96   | 11                        | 12   | 44888     | 553097    | 62                           | 63   | 359.50    | 2318.35   |
| 12                         | 12   | 43091     | 530221    | 63                           | 63   | 336.27    | 2134.63   | 12                        | 13   | 41393     | 508209    | 63                           | 64   | 313.80    | 1958.85   |
| 13                         | 13   | 39763     | 487130    | 64                           | 64   | 292.82    | 1798.36   | 13                        | 14   | 38214     | 466816    | 64                           | 65   | 272.55    | 1645.05   |
| 14                         | 14   | 36726     | 447367    | 65                           | 65   | 253.69    | 1505.54   | 14                        | 15   | 35301     | 428602    | 65                           | 66   | 235.45    | 1372.50   |
| 15                         | 15   | 33933     | 410641    | 66                           | 66   | 218.52    | 1251.85   | 15                        | 16   | 32613     | 393301    | 66                           | 67   | 202.20    | 1137.05   |
| 16                         | 16   | 31345     | 376708    | 67                           | 67   | 187.09    | 1033.33   | 16                        | 17   | 30114     | 360688    | 67                           | 68   | 172.53    | 934.847   |
| 17                         | 17   | 28932     | 345363    | 68                           | 68   | 159.11    | 846.249   | 17                        | 18   | 27783     | 330574    | 68                           | 69   | 146.21    | 762.317   |
| 18                         | 18   | 26680     | 316431    | 69                           | 69   | 134.35    | 687.139   | 18                        | 19   | 25610     | 302791    | 69                           | 70   | 122.96    | 616.107   |
| 19                         | 19   | 24583     | 289751    | 70                           | 70   | 112.54    | 552.789   | 19                        | 20   | 23587     | 277181    | 70                           | 71   | 102.55    | 493.147   |
| 20                         | 20   | 22632     | 265168    | 71                           | 71   | 93.456    | 440.249   | 20                        | 21   | 21707     | 253594    | 71                           | 72   | 84.749    | 390.597   |
| 21                         | 21   | 20821     | 242536    | 72                           | 72   | 76.854    | 346.793   | 21                        | 22   | 19964     | 231887    | 72                           | 73   | 69.328    | 305.848   |
| 22                         | 22   | 19143     | 221715    | 73                           | 73   | 62.540    | 269.939   | 22                        | 23   | 18349     | 211923    | 73                           | 74   | 56.079    | 236.520   |
| 23                         | 23   | 17589     | 202572    | 74                           | 74   | 50.286    | 207.399   | 23                        | 24   | 16855     | 193574    | 74                           | 75   | 44.808    | 180.441   |
| 24                         | 24   | 16152     | 184983    | 75                           | 75   | 39.926    | 157.113   | 24                        | 25   | 15473     | 176719    | 75                           | 76   | 35.316    | 135.633   |
| 25                         | 25   | 14822     | 168831    | 76                           | 76   | 31.239    | 117.187   | 25                        | 26   | 14195     | 161246    | 76                           | 77   | 27.416    | 100.317   |
| 26                         | 26   | 13594     | 154009    | 77                           | 77   | 24.061    | 85.9483   | 26                        | 27   | 13016     | 147051    | 77                           | 78   | 20.925    | 72.9005   |
| 27                         | 27   | 12462     | 140415    | 78                           | 78   | 18.198    | 61.8873   | 27                        | 28   | 11929     | 134035    | 78                           | 79   | 15.671    | 51.9755   |
| 28                         | 28   | 11420     | 127953    | 79                           | 79   | 13.495    | 43.6893   | 28                        | 29   | 10929     | 122106    | 79                           | 80   | 11.494    | 36.3045   |
| 29                         | 29   | 10460     | 116533    | 80                           | 80   | 9.7895    | 30.1943   | 29                        | 30   | 10010     | 111177    | 80                           | 81   | 8.2438    | 24.8105   |
| 30                         | 30   | 9579.5    | 106073    | 81                           | 81   | 6.9422    | 20.4048   | 30                        | 31   | 9166.1    | 101167    | 81                           | 82   | 5.7737    | 16.5667   |
| 31                         | 31   | 8770.5    | 96493.8   | 82                           | 82   | 4.8019    | 13.4626   | 31                        | 32   | 8390.8    | 92001.3   | 82                           | 83   | 3.9431    | 10.7930   |
| 32                         | 32   | 8027.7    | 87723.3   | 83                           | 83   | 3.2379    | 8.66066   | 32                        | 33   | 7679.3    | 83610.5   | 83                           | 84   | 2.6230    | 6.84989   |
| 33                         | 33   | 7346.0    | 79695.6   | 84                           | 84   | 2.1249    | 5.42276   | 33                        | 34   | 7026.1    | 75931.2   | 84                           | 85   | 1.6968    | 4.22689   |
| 34                         | 34   | 6720.2    | 72349.6   | 85                           | 85   | 1.3550    | 3.29786   | 34                        | 35   | 6426.6    | 68905.1   | 85                           | 86   | 1.0647    | 2.53009   |
| 35                         | 35   | 6145.8    | 65629.4   | 86                           | 86   | .83662    | 1.94286   | 35                        | 36   | 5876.3    | 62478.5   | 86                           | 87   | .64630    | 1.46539   |
| 36                         | 36   | 5618.7    | 59483.6   | 87                           | 87   | .49928    | 1.10624   | 36                        | 37   | 5371.3    | 56602.2   | 87                           | 88   | .37760    | .81909    |
| 37                         | 37   | 5134.8    | 53864.9   | 88                           | 88   | .28557    | .60696    | 37                        | 38   | 4907.7    | 51230.9   | 88                           | 89   | .21232    | .44149    |
| 38                         | 38   | 4690.7    | 48730.1   | 89                           | 89   | .15786    | .32139    | 38                        | 39   | 4482.2    | 46323.2   | 89                           | 90   | .11492    | .22917    |
| 39                         | 39   | 4283.0    | 44039.4   | 90                           | 90   | .08366    | .16353    | 39                        | 40   | 4091.5    | 41841.0   | 90                           | 91   | .05962    | .11425    |
| 40                         | 40   | 3908.6    | 39756.4   | 91                           | 91   | .04248    | .07987    | 40                        | 41   | 3732.8    | 37749.5   | 91                           | 92   | .02961    | .05463    |
| 41                         | 41   | 3564.9    | 35847.8   | 92                           | 92   | .02064    | .03739    | 41                        | 42   | 3403.4    | 34016.7   | 92                           | 93   | .01405    | .02502    |
| 42                         | 42   | 3249.2    | 32282.9   | 93                           | 93   | .00957    | .01675    | 42                        | 43   | 3100.9    | 30613.3   | 93                           | 94   | .00637    | .01097    |
| 43                         | 43   | 2959.4    | 29033.7   | 94                           | 94   | .00424    | .00718    | 43                        | 44   | 2823.3    | 27512.4   | 94                           | 95   | .00276    | .00460    |
| 44                         | 44   | 2693.3    | 26074.3   | 95                           | 95   | .00179    | .00294    | 44                        | 45   | 2568.3    | 24689.1   | 95                           | 96   | .00114    | .00184    |
| 45                         | 45   | 2449.1    | 23381.0   | 96                           | 96   | .00072    | .00115    | 45                        | 46   | 2334.3    | 22120.8   | 96                           | 97   | .00045    | .00070    |
| 46                         | 46   | 2224.9    | 20931.9   | 97                           | 97   | .00028    | .00043    | 46                        | 47   | 2119.6    | 19786.5   | 97                           | 98   | .00017    | .00025    |
| 47                         | 47   | 2019.3    | 18707.0   | 98                           | 98   | .00010    | .00015    | 47                        | 48   | 1922.8    | 17666.9   | 98                           | 99   | .00006    | .00008    |
| 48                         | 48   | 1830.8    | 16687.7   | 99                           | 99   | .00004    | .00005    | 48                        | 49   | 1742.3    | 15744.1   | 99                           | 100  | .00002    | .00002    |
| 49                         | 49   | 1658.1    | 14856.9   | 100                          | 100  | .00001    | .00001    | 49                        | 50   | 1576.9    | 14001.8   | 100                          | 101  | .00000    | .00000    |
| 50                         | 50   | 1499.8    | 13198.8   | 101                          | 101  | .00000    | .00000    | 50                        | 51   | 1425.4    | 12424.9   | 101                          | 102  | .00000    | .00000    |
| 51                         | 51   | 1354.8    | 11699.0   | 102                          | 102  | .00000    | .00000    | 51                        | 52   | 1286.7    | 10999.5   | 102                          | 103  | .00000    | .00000    |
| 52                         | 52   | 1222.0    | 10344.2   | 103                          | 103  | .00000    | .00000    | 52                        | 53   | 1159.6    | 97128.8   | 103                          | 104  | .00000    | .00000    |
| 53                         | 53   | 1100.3    | 9122.20   | 104                          | 104  | .00000    | .00000    | 53                        | 54   | 1043.1    | 8553.28   | 104                          | 105  | .00000    | .00000    |
| 54                         | 54   | 988.94    | 8021.90   | 105                          | 105  | .00000    | .00000    | 54                        | 55   | 936.58    | 7510.18   | 105                          | 106  | .00000    | .00000    |
| 55                         | 55   | 886.99    | 7032.96   | 106                          | 106  | .00000    | .00000    | 55                        | 56   | 839.09    | 6573.60   | DIFFERENCE OF AGE, 95 YEARS. |      |           |           |
| 56                         | 56   | 793.77    | 6145.97   | DIFFERENCE OF AGE, 96 YEARS. |      |           |           | 56                        | 57   | 750.02    | 5734.51   |                              |      |           |           |
| 57                         | 57   | 708.68    | 5352.20   |                              |      |           |           | 57                        | 58   | 668.71    | 4984.49   |                              |      |           |           |
| 58                         | 58   | 630.99    | 4643.52   |                              |      |           |           | 58                        | 59   | 594.58    | 4315.78   |                              |      |           |           |
| 59                         | 59   | 560.26    | 4012.53   |                              |      |           |           | 59                        | 60   | 527.09    | 3721.20   | 10                           | 105  | .06131    | .08026    |
| 60                         | 60   | 495.89    | 3452.27   | 10                           | 106  | .01976    | .01976    | 60                        | 61   | 465.74    | 3194.11   | 11                           | 106  | .01895    | .01895    |

96 YEARS.

95 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 2 YEARS. |    |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 3 YEARS. |    |                  |                  |                              |     |                  |                  |
|-----------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|-----------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                       |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                       |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                          | y. |                  |                  | x.                           | y.  |                  |                  | x.                          | y. |                  |                  | x.                           | y.  |                  |                  |
| 10                          | 12 | 46803            | 576941           | 61                           | 63  | 383·53           | 2509·99          | 10                          | 13 | 44959            | 552974           | 61                           | 64  | 357·89           | 2301·23          |
| 11                          | 13 | 43120            | 530138           | 62                           | 64  | 335·47           | 2126·46          | 11                          | 14 | 41440            | 508015           | 62                           | 65  | 312·25           | 1943·34          |
| 12                          | 14 | 39781            | 487018           | 63                           | 65  | 292·08           | 1790·99          | 12                          | 15 | 38238            | 466575           | 63                           | 66  | 271·07           | 1631·09          |
| 13                          | 15 | 36732            | 447237           | 64                           | 66  | 252·96           | 1498·91          | 13                          | 16 | 35304            | 428337           | 64                           | 67  | 234·06           | 1360·02          |
| 14                          | 16 | 33929            | 410505           | 65                           | 67  | 217·86           | 1245·95          | 14                          | 17 | 32597            | 393033           | 65                           | 68  | 200·91           | 1125·96          |
| 15                          | 17 | 31333            | 376576           | 66                           | 68  | 186·46           | 1028·09          | 15                          | 18 | 30089            | 360436           | 66                           | 69  | 171·34           | 925·045          |
| 16                          | 18 | 28919            | 345243           | 67                           | 69  | 158·54           | 841·630          | 16                          | 19 | 27759            | 330347           | 67                           | 70  | 145·10           | 753·705          |
| 17                          | 19 | 26669            | 316324           | 68                           | 70  | 133·81           | 683·090          | 17                          | 20 | 25589            | 302588           | 68                           | 71  | 121·94           | 608·605          |
| 18                          | 20 | 24573            | 289655           | 69                           | 71  | 112·05           | 549·280          | 18                          | 21 | 23569            | 276999           | 69                           | 72  | 101·61           | 486·665          |
| 19                          | 21 | 22624            | 265082           | 70                           | 72  | 92·999           | 437·230          | 19                          | 22 | 21693            | 253430           | 70                           | 73  | 83·893           | 385·055          |
| 20                          | 22 | 20814            | 242458           | 71                           | 73  | 76·451           | 344·231          | 20                          | 23 | 19952            | 231737           | 71                           | 74  | 68·553           | 301·162          |
| 21                          | 23 | 19137            | 221644           | 72                           | 74  | 62·167           | 267·780          | 21                          | 24 | 18338            | 211785           | 72                           | 75  | 55·394           | 232·609          |
| 22                          | 24 | 17584            | 202507           | 73                           | 75  | 49·970           | 205·613          | 22                          | 25 | 16844            | 193447           | 73                           | 76  | 44·200           | 177·215          |
| 23                          | 25 | 16147            | 184923           | 74                           | 76  | 39·634           | 155·643          | 23                          | 26 | 15463            | 176603           | 74                           | 77  | 34·784           | 133·015          |
| 24                          | 26 | 14818            | 168776           | 75                           | 77  | 30·994           | 116·009          | 24                          | 27 | 14188            | 161140           | 75                           | 78  | 26·955           | 98·2308          |
| 25                          | 27 | 13591            | 153958           | 76                           | 78  | 23·843           | 85·0153          | 25                          | 28 | 13010            | 146952           | 76                           | 79  | 20·532           | 71·2758          |
| 26                          | 28 | 12460            | 140367           | 77                           | 79  | 18·020           | 61·1723          | 26                          | 29 | 11925            | 133942           | 77                           | 80  | 15·347           | 50·7438          |
| 27                          | 29 | 11418            | 127907           | 78                           | 80  | 13·347           | 43·1523          | 27                          | 30 | 10926            | 122017           | 78                           | 81  | 11·240           | 35·3968          |
| 28                          | 30 | 10459            | 116489           | 79                           | 81  | 9·6792           | 29·8053          | 28                          | 31 | 10008            | 111091           | 79                           | 82  | 8·0500           | 24·1568          |
| 29                          | 31 | 9578·2           | 106031           | 80                           | 82  | 6·8562           | 20·1261          | 29                          | 32 | 9163·7           | 101084           | 80                           | 83  | 5·6300           | 16·1068          |
| 30                          | 32 | 8769·3           | 96452·5          | 81                           | 83  | 4·7411           | 13·2699          | 30                          | 33 | 8388·7           | 91920·3          | 81                           | 84  | 3·8408           | 10·4768          |
| 31                          | 33 | 8026·7           | 87683·2          | 82                           | 84  | 3·1943           | 8·52880          | 31                          | 34 | 7677·2           | 83531·6          | 82                           | 85  | 2·5508           | 6·63595          |
| 32                          | 34 | 7344·8           | 79656·5          | 83                           | 85  | 2·0946           | 5·33450          | 32                          | 35 | 7024·0           | 75854·4          | 83                           | 86  | 1·6459           | 4·08515          |
| 33                          | 35 | 6719·2           | 72311·7          | 84                           | 86  | 1·3333           | 3·23990          | 33                          | 36 | 6424·5           | 68830·4          | 84                           | 87  | 1·0300           | 2·43925          |
| 34                          | 36 | 6144·8           | 65592·5          | 85                           | 87  | ·82251           | 1·90660          | 34                          | 37 | 5874·3           | 62405·9          | 85                           | 88  | ·62206           | 1·40925          |
| 35                          | 37 | 5617·6           | 59447·7          | 86                           | 88  | ·48879           | 1·08409          | 35                          | 38 | 5369·2           | 56531·6          | 86                           | 89  | ·36341           | ·78719           |
| 36                          | 38 | 5133·8           | 53830·1          | 87                           | 89  | ·28074           | ·59530           | 36                          | 39 | 4905·6           | 51162·4          | 87                           | 90  | ·20438           | ·42378           |
| 37                          | 39 | 4689·6           | 48696·3          | 88                           | 90  | ·15457           | ·31456           | 37                          | 40 | 4479·9           | 46256·8          | 88                           | 91  | ·11014           | ·21940           |
| 38                          | 40 | 4281·8           | 44006·7          | 89                           | 91  | ·08189           | ·15999           | 38                          | 41 | 4089·2           | 41776·9          | 89                           | 92  | ·05708           | ·10926           |
| 39                          | 41 | 3907·5           | 39724·9          | 90                           | 92  | ·04156           | ·07810           | 39                          | 42 | 3730·5           | 37687·7          | 90                           | 93  | ·02829           | ·05218           |
| 40                          | 42 | 3563·7           | 35817·4          | 91                           | 93  | ·02016           | ·03654           | 40                          | 43 | 3401·1           | 33957·2          | 91                           | 94  | ·01341           | ·02389           |
| 41                          | 43 | 3248·1           | 32253·7          | 92                           | 94  | ·00935           | ·01638           | 41                          | 44 | 3098·6           | 30556·1          | 92                           | 95  | ·00608           | ·01048           |
| 42                          | 44 | 2958·2           | 29005·6          | 93                           | 95  | ·00414           | ·00703           | 42                          | 45 | 2820·9           | 27457·5          | 93                           | 96  | ·00263           | ·00440           |
| 43                          | 45 | 2692·2           | 26047·4          | 94                           | 96  | ·00175           | ·00289           | 43                          | 46 | 2566·0           | 24636·6          | 94                           | 97  | ·00109           | ·00177           |
| 44                          | 46 | 2447·9           | 23355·2          | 95                           | 97  | ·00071           | ·00114           | 44                          | 47 | 2332·1           | 22070·6          | 95                           | 98  | ·00043           | ·00068           |
| 45                          | 47 | 2223·8           | 20907·3          | 96                           | 98  | ·00028           | ·00043           | 45                          | 48 | 2117·5           | 19738·5          | 96                           | 99  | ·00017           | ·00025           |
| 46                          | 48 | 2018·3           | 18683·5          | 97                           | 99  | ·00010           | ·00015           | 46                          | 49 | 1920·7           | 17621·0          | 97                           | 100 | ·00006           | ·00008           |
| 47                          | 49 | 1829·8           | 16665·2          | 98                           | 100 | ·00004           | ·00005           | 47                          | 50 | 1740·3           | 15700·3          | 98                           | 101 | ·00002           | ·00002           |
| 48                          | 50 | 1657·0           | 14835·4          | 99                           | 101 | ·00001           | ·00001           | 48                          | 51 | 1574·9           | 13960·0          | 99                           | 102 | ·00000           | ·00000           |
| 49                          | 51 | 1498·8           | 13178·4          | 100                          | 102 | ·00000           | ·00000           | 49                          | 52 | 1423·4           | 12385·1          | 100                          | 103 | ·00000           | ·00000           |
| 50                          | 52 | 1353·8           | 11679·6          | 101                          | 103 | ·00000           | ·00000           | 50                          | 53 | 1284·6           | 10961·7          | 101                          | 104 | ·00000           | ·00000           |
| 51                          | 53 | 1221·0           | 10325·8          | 102                          | 104 | ·00000           | ·00000           | 51                          | 54 | 1157·5           | 9677·10          | 102                          | 105 | ·00000           | ·00000           |
| 52                          | 54 | 1099·3           | 9104·88          | 103                          | 105 | ·00000           | ·00000           | 52                          | 55 | 1041·1           | 8519·60          | 103                          | 106 | ·00000           | ·00000           |
| 53                          | 55 | 987·92           | 8005·58          | 104                          | 106 | ·00000           | ·00000           | 53                          | 56 | 934·56           | 7478·50          | DIFFERENCE OF AGE, 93 YEARS. |     |                  |                  |
| 54                          | 56 | 886·00           | 7017·66          | DIFFERENCE OF AGE, 94 YEARS. |     |                  |                  | 54                          | 57 | 837·16           | 6543·94          |                              |     |                  |                  |
| 55                          | 57 | 792·84           | 6131·66          |                              |     |                  |                  | 55                          | 58 | 748·12           | 5706·78          | 10                           | 103 | ·17495           | ·35025           |
| 56                          | 58 | 707·72           | 5338·82          | 10                           | 104 | ·10570           | ·18269           | 56                          | 59 | 666·87           | 4958·66          | 11                           | 104 | ·10138           | ·17530           |
| 57                          | 59 | 630·12           | 4631·10          | 11                           | 105 | ·05880           | ·07699           | 57                          | 60 | 592·81           | 4291·79          | 12                           | 105 | ·05645           | ·07392           |
| 58                          | 60 | 559·38           | 4000·98          | 12                           | 106 | ·01819           | ·01819           | 58                          | 61 | 525·36           | 3698·98          | 13                           | 106 | ·01747           | ·01747           |
| 59                          | 61 | 495·05           | 3441·60          |                              |     |                  |                  | 59                          | 62 | 464·03           | 3173·62          |                              |     |                  |                  |
| 60                          | 62 | 436·56           | 2946·55          |                              |     |                  |                  | 60                          | 63 | 408·36           | 2709·59          |                              |     |                  |                  |

94 YEARS.

93 YEARS.



TABLE 14—(continued).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

| DIFFERENCE OF AGE, 4 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 5 YEARS. |       |           |           |                              |       |           |           |
|-----------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|-----------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                       |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                       |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                       | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                       | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                          | 14    | 43208     | 529893    | 61                           | 65    | 333·12    | 2102·14   | 10                          | 15    | 41533     | 507635    | 61                           | 66    | 309·17    | 1912·68   |
| 11                          | 15    | 39834     | 486685    | 62                           | 66    | 289·80    | 1769·02   | 11                          | 16    | 38285     | 466102    | 62                           | 67    | 268·15    | 1603·51   |
| 12                          | 16    | 36752     | 446851    | 63                           | 67    | 250·83    | 1479·22   | 12                          | 17    | 35308     | 427817    | 63                           | 68    | 231·31    | 1335·36   |
| 13                          | 17    | 33918     | 410099    | 64                           | 68    | 215·85    | 1228·39   | 13                          | 18    | 32571     | 392509    | 64                           | 69    | 198·34    | 1104·05   |
| 14                          | 18    | 31303     | 376181    | 65                           | 69    | 184·62    | 1012·54   | 14                          | 19    | 30047     | 359938    | 65                           | 70    | 168·96    | 905·713   |
| 15                          | 19    | 28882     | 344878    | 66                           | 70    | 156·81    | 827·923   | 15                          | 20    | 27712     | 329891    | 66                           | 71    | 142·90    | 736·753   |
| 16                          | 20    | 26635     | 315996    | 67                           | 71    | 132·23    | 671·113   | 16                          | 21    | 25547     | 302179    | 67                           | 72    | 119·91    | 593·853   |
| 17                          | 21    | 24543     | 289361    | 68                           | 72    | 110·58    | 538·883   | 17                          | 22    | 23534     | 276632    | 68                           | 73    | 99·753    | 473·943   |
| 18                          | 22    | 22599     | 264818    | 69                           | 73    | 91·664    | 428·303   | 18                          | 23    | 21663     | 253098    | 69                           | 74    | 82·195    | 374·190   |
| 19                          | 23    | 20794     | 242219    | 70                           | 74    | 75·226    | 336·639   | 19                          | 24    | 19926     | 231435    | 70                           | 75    | 67·031    | 291·995   |
| 20                          | 24    | 19119     | 221425    | 71                           | 75    | 61·085    | 261·413   | 20                          | 25    | 18315     | 211509    | 71                           | 76    | 54·032    | 224·964   |
| 21                          | 25    | 17567     | 202306    | 72                           | 76    | 48·998    | 200·328   | 21                          | 26    | 16824     | 193194    | 72                           | 77    | 43·002    | 170·932   |
| 22                          | 26    | 16132     | 184739    | 73                           | 77    | 38·791    | 151·330   | 22                          | 27    | 15445     | 176370    | 73                           | 78    | 33·736    | 127·930   |
| 23                          | 27    | 14805     | 168607    | 74                           | 78    | 30·251    | 112·539   | 23                          | 28    | 14173     | 160925    | 74                           | 79    | 26·050    | 94·1941   |
| 24                          | 28    | 13581     | 153802    | 75                           | 79    | 23·212    | 82·2875   | 24                          | 29    | 12998     | 146752    | 75                           | 80    | 19·770    | 68·1441   |
| 25                          | 29    | 12452     | 140221    | 76                           | 80    | 17·488    | 59·0755   | 25                          | 30    | 11916     | 133754    | 76                           | 81    | 14·726    | 48·3741   |
| 26                          | 30    | 11412     | 127769    | 77                           | 81    | 12·924    | 41·5875   | 26                          | 31    | 10919     | 121838    | 77                           | 82    | 10·749    | 33·6481   |
| 27                          | 31    | 10454     | 116357    | 78                           | 82    | 9·3480    | 28·6635   | 27                          | 32    | 10002     | 110919    | 78                           | 83    | 7·6761    | 22·8991   |
| 28                          | 32    | 9574·6    | 105904    | 79                           | 83    | 6·6103    | 19·3155   | 28                          | 33    | 9159·0    | 100917    | 79                           | 84    | 5·3550    | 15·2230   |
| 29                          | 33    | 8766·0    | 96329·0   | 80                           | 84    | 4·5609    | 12·7052   | 29                          | 34    | 8384·3    | 91757·9   | 80                           | 85    | 3·6421    | 9·86796   |
| 30                          | 34    | 8023·5    | 87563·0   | 81                           | 85    | 3·0670    | 8·14427   | 30                          | 35    | 7672·9    | 83373·6   | 81                           | 86    | 2·4100    | 6·22586   |
| 31                          | 35    | 7341·8    | 79539·5   | 82                           | 86    | 2·0043    | 5·07727   | 31                          | 36    | 7019·8    | 75700·7   | 82                           | 87    | 1·5484    | 3·81586   |
| 32                          | 36    | 6716·0    | 72197·7   | 83                           | 87    | 1·2715    | 3·07297   | 32                          | 37    | 6420·3    | 68680·9   | 83                           | 88    | ·96159    | 2·26746   |
| 33                          | 37    | 6141·7    | 65481·7   | 84                           | 88    | ·77899    | 1·80147   | 33                          | 38    | 5870·1    | 62260·6   | 84                           | 89    | ·57917    | 1·30587   |
| 34                          | 38    | 5614·5    | 59340·0   | 85                           | 89    | ·46249    | 1·02248   | 34                          | 39    | 5365·0    | 56390·5   | 85                           | 90    | ·33669    | ·72670    |
| 35                          | 39    | 5130·6    | 53725·5   | 86                           | 90    | ·26456    | ·55999    | 35                          | 40    | 4901·2    | 51025·5   | 86                           | 91    | ·18852    | ·39001    |
| 36                          | 40    | 4686·2    | 48594·9   | 87                           | 91    | ·14564    | ·29543    | 36                          | 41    | 4475·5    | 46124·3   | 87                           | 92    | ·10152    | ·20149    |
| 37                          | 41    | 4278·4    | 43908·7   | 88                           | 92    | ·07678    | ·14979    | 37                          | 42    | 4084·6    | 41648·8   | 88                           | 93    | ·05227    | ·09997    |
| 38                          | 42    | 3904·0    | 39630·3   | 89                           | 93    | ·03886    | ·07301    | 38                          | 43    | 3725·9    | 37564·2   | 89                           | 94    | ·02586    | ·04770    |
| 39                          | 43    | 3560·2    | 35726·3   | 90                           | 94    | ·01883    | ·03415    | 39                          | 44    | 3396·4    | 33838·3   | 90                           | 95    | ·01225    | ·02184    |
| 40                          | 44    | 3244·5    | 32166·1   | 91                           | 95    | ·00873    | ·01532    | 40                          | 45    | 3093·9    | 30441·9   | 91                           | 96    | ·00555    | ·00959    |
| 41                          | 45    | 2954·8    | 28921·6   | 92                           | 96    | ·00387    | ·00659    | 41                          | 46    | 2816·3    | 27348·0   | 92                           | 97    | ·00241    | ·00404    |
| 42                          | 46    | 2688·7    | 25966·8   | 93                           | 97    | ·00164    | ·00272    | 42                          | 47    | 2561·5    | 24531·7   | 93                           | 98    | ·00099    | ·00163    |
| 43                          | 47    | 2444·6    | 23278·1   | 94                           | 98    | ·00067    | ·00108    | 43                          | 48    | 2327·7    | 21970·2   | 94                           | 99    | ·00040    | ·00064    |
| 44                          | 48    | 2220·6    | 20833·5   | 95                           | 99    | ·00026    | ·00041    | 44                          | 49    | 2113·2    | 19642·5   | 95                           | 100   | ·00016    | 00024     |
| 45                          | 49    | 2015·1    | 18612·9   | 96                           | 100   | ·00010    | ·00015    | 45                          | 50    | 1916·5    | 17529·3   | 96                           | 101   | ·00006    | ·00008    |
| 46                          | 50    | 1826·7    | 16597·8   | 97                           | 101   | ·00004    | ·00005    | 46                          | 51    | 1736·2    | 15612·8   | 97                           | 102   | ·00002    | ·00002    |
| 47                          | 51    | 1654·0    | 14771·1   | 98                           | 102   | ·00001    | ·00001    | 47                          | 52    | 1570·8    | 13876·6   | 98                           | 103   | ·00000    | ·00000    |
| 48                          | 52    | 1495·7    | 13117·1   | 99                           | 103   | ·00000    | ·00000    | 48                          | 53    | 1419·3    | 12305·8   | 99                           | 104   | ·00000    | ·00000    |
| 49                          | 53    | 1350·7    | 11621·4   | 100                          | 104   | ·00000    | ·00000    | 49                          | 54    | 1280·5    | 10886·5   | 100                          | 105   | ·00000    | ·00000    |
| 50                          | 54    | 1217·9    | 10270·7   | 101                          | 105   | ·00000    | ·00000    | 50                          | 55    | 1153·4    | 9605·97   | 101                          | 106   | ·00000    | ·00000    |
| 51                          | 55    | 1096·2    | 9052·87   | 102                          | 106   | ·00000    | ·00000    | 51                          | 56    | 1037·0    | 8452·57   | DIFFERENCE OF AGE, 91 YEARS. |       |           |           |
| 52                          | 56    | 984·87    | 7956·67   | DIFFERENCE OF AGE, 92 YEARS. |       |           |           | 52                          | 57    | 930·58    | 7415·57   |                              |       |           |           |
| 53                          | 57    | 883·05    | 6971·80   |                              |       |           |           | 53                          | 58    | 833·24    | 6484·99   | 10                           | 101   | ·49138    | 1·09623   |
| 54                          | 58    | 789·94    | 6088·75   | 10                           | 102   | ·29407    | ·63020    | 54                          | 59    | 744·36    | 5651·75   | 11                           | 102   | ·28204    | ·60485    |
| 55                          | 59    | 704·95    | 5298·81   | 11                           | 103   | ·16779    | ·33613    | 55                          | 60    | 663·21    | 4907·39   | 12                           | 103   | ·16107    | ·32281    |
| 56                          | 60    | 627·39    | 4593·86   | 12                           | 104   | ·09732    | ·16834    | 56                          | 61    | 589·25    | 4244·18   | 13                           | 104   | ·09349    | ·16174    |
| 57                          | 61    | 556·77    | 3966·47   | 13                           | 105   | ·05423    | ·07102    | 57                          | 62    | 521·89    | 3654·93   | 14                           | 105   | ·05211    | ·06825    |
| 58                          | 62    | 492·45    | 3409·70   | 14                           | 106   | ·01679    | ·01679    | 58                          | 63    | 460·64    | 3133·04   | 15                           | 106   | ·01614    | ·01614    |
| 59                          | 63    | 434·05    | 2917·25   |                              |       |           |           | 59                          | 64    | 405·04    | 2672·40   |                              |       |           |           |
| 60                          | 64    | 381·06    | 2483·20   |                              |       |           |           | 60                          | 65    | 354·68    | 2267·36   |                              |       |           |           |

92 YEARS.

91 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 6 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 7 YEARS. |       |           |           |                              |       |           |           |
|-----------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|-----------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                       |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                       |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                       | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                       | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                          | 16    | 39918     | 486158    | 61                           | 67    | 286·07    | 1732·96   | 10                          | 17    | 38350     | 465433    | 61                           | 68    | 263·81    | 1562·95   |
| 11                          | 17    | 36781     | 446240    | 62                           | 68    | 247·28    | 1446·89   | 11                          | 18    | 35321     | 427083    | 62                           | 69    | 227·23    | 1299·14   |
| 12                          | 18    | 33907     | 409459    | 63                           | 69    | 212·55    | 1199·61   | 12                          | 19    | 32547     | 391762    | 63                           | 70    | 194·53    | 1071·91   |
| 13                          | 19    | 31265     | 375552    | 64                           | 70    | 181·53    | 987·061   | 13                          | 20    | 29998     | 359215    | 64                           | 71    | 165·43    | 877·384   |
| 14                          | 20    | 28830     | 344287    | 65                           | 71    | 153·98    | 805·531   | 14                          | 21    | 27652     | 329217    | 65                           | 72    | 139·63    | 711·954   |
| 15                          | 21    | 26580     | 315457    | 66                           | 72    | 129·59    | 651·551   | 15                          | 22    | 25486     | 301565    | 66                           | 73    | 116·90    | 572·324   |
| 16                          | 22    | 24496     | 288877    | 67                           | 73    | 108·17    | 521·961   | 16                          | 23    | 23481     | 276079    | 67                           | 74    | 96·996    | 455·424   |
| 17                          | 23    | 22559     | 264381    | 68                           | 74    | 89·448    | 413·791   | 17                          | 24    | 21617     | 252598    | 68                           | 75    | 79·703    | 358·428   |
| 18                          | 24    | 20759     | 241822    | 69                           | 75    | 73·240    | 324·343   | 18                          | 25    | 19886     | 230981    | 69                           | 76    | 64·784    | 278·725   |
| 19                          | 25    | 19088     | 221063    | 70                           | 76    | 59·292    | 251·103   | 19                          | 26    | 18281     | 211095    | 70                           | 77    | 52·035    | 213·941   |
| 20                          | 26    | 17540     | 201975    | 71                           | 77    | 47·420    | 191·811   | 20                          | 27    | 16794     | 192814    | 71                           | 78    | 41·240    | 161·906   |
| 21                          | 27    | 16108     | 184435    | 72                           | 78    | 37·398    | 144·391   | 21                          | 28    | 15420     | 176020    | 72                           | 79    | 32·205    | 120·666   |
| 22                          | 28    | 14785     | 168327    | 73                           | 79    | 29·051    | 106·993   | 22                          | 29    | 14151     | 160600    | 73                           | 80    | 24·743    | 88·4610   |
| 23                          | 29    | 13564     | 153542    | 74                           | 80    | 22·187    | 77·9419   | 23                          | 30    | 12981     | 146449    | 74                           | 81    | 18·684    | 63·7180   |
| 24                          | 30    | 12439     | 139978    | 75                           | 81    | 16·649    | 55·7549   | 24                          | 31    | 11902     | 133468    | 75                           | 82    | 13·846    | 45·0340   |
| 25                          | 31    | 11402     | 127539    | 76                           | 82    | 12·248    | 39·1059   | 25                          | 32    | 10908     | 121566    | 76                           | 83    | 10·057    | 31·1880   |
| 26                          | 32    | 10447     | 116137    | 77                           | 83    | 8·8264    | 26·8579   | 26                          | 33    | 9993·2    | 110658    | 77                           | 84    | 7·1504    | 21·1310   |
| 27                          | 33    | 9568·0    | 105690    | 78                           | 84    | 6·2185    | 18·0315   | 27                          | 34    | 9151·4    | 100665    | 78                           | 85    | 4·9657    | 13·9806   |
| 28                          | 34    | 8760·2    | 96122·1   | 79                           | 85    | 4·2762    | 11·8130   | 28                          | 35    | 8377·5    | 91513·9   | 79                           | 86    | 3·3601    | 9·01489   |
| 29                          | 35    | 8018·0    | 87361·9   | 80                           | 86    | 2·8618    | 7·53681   | 29                          | 36    | 7666·4    | 83136·4   | 80                           | 87    | 2·2108    | 5·65479   |
| 30                          | 36    | 7336·5    | 79343·9   | 81                           | 87    | 1·8617    | 4·67501   | 30                          | 37    | 7013·5    | 75470·0   | 81                           | 88    | 1·4080    | 3·44399   |
| 31                          | 37    | 6710·8    | 72007·4   | 82                           | 88    | 1·1710    | 2·81331   | 31                          | 38    | 6414·0    | 68456·5   | 82                           | 89    | ·87064    | 2·03599   |
| 32                          | 38    | 6136·4    | 65296·6   | 83                           | 89    | ·71493    | 1·64231   | 32                          | 39    | 5863·7    | 62042·5   | 83                           | 90    | ·52046    | 1·16535   |
| 33                          | 39    | 5609·2    | 59160·2   | 84                           | 90    | ·42163    | ·92738    | 33                          | 40    | 5358·4    | 56178·8   | 84                           | 91    | ·30045    | ·64489    |
| 34                          | 40    | 5125·1    | 53551·0   | 85                           | 91    | ·23992    | ·50575    | 34                          | 41    | 4894·6    | 50820·4   | 85                           | 92    | ·16724    | ·34444    |
| 35                          | 41    | 4680·7    | 48425·9   | 86                           | 92    | ·13141    | ·26583    | 35                          | 42    | 4468·7    | 45925·8   | 86                           | 93    | ·08946    | ·17720    |
| 36                          | 42    | 4271·8    | 43745·2   | 87                           | 93    | ·06911    | ·13442    | 36                          | 43    | 4077·8    | 41457·1   | 87                           | 94    | ·04599    | ·08774    |
| 37                          | 43    | 3898·2    | 39473·4   | 88                           | 94    | ·03479    | ·06531    | 37                          | 44    | 3718·8    | 37379·3   | 88                           | 95    | ·02262    | ·04175    |
| 38                          | 44    | 3554·4    | 35575·2   | 89                           | 95    | ·01682    | ·03052    | 38                          | 45    | 3389·4    | 33660·5   | 89                           | 96    | ·01069    | ·01913    |
| 39                          | 45    | 3238·7    | 32020·8   | 90                           | 96    | ·00779    | ·01370    | 39                          | 46    | 3086·9    | 30271·1   | 90                           | 97    | ·00485    | ·00844    |
| 40                          | 46    | 2948·9    | 28782·1   | 91                           | 97    | ·00345    | ·00591    | 40                          | 47    | 2809·4    | 27184·2   | 91                           | 98    | ·00211    | ·00359    |
| 41                          | 47    | 2683·0    | 25833·2   | 92                           | 98    | ·00147    | ·00246    | 41                          | 48    | 2554·7    | 24374·8   | 92                           | 99    | ·00089    | ·00148    |
| 42                          | 48    | 2439·0    | 23150·2   | 93                           | 99    | ·00061    | ·00099    | 42                          | 49    | 2321·1    | 21820·1   | 93                           | 100   | ·00037    | ·00059    |
| 43                          | 49    | 2215·2    | 20711·2   | 94                           | 100   | ·00024    | ·00038    | 43                          | 50    | 2106·8    | 19499·0   | 94                           | 101   | ·00014    | ·00022    |
| 44                          | 50    | 2009·8    | 18496·0   | 95                           | 101   | ·00009    | ·00014    | 44                          | 51    | 1910·2    | 17392·2   | 95                           | 102   | ·00006    | ·00008    |
| 45                          | 51    | 1821·5    | 16486·2   | 96                           | 102   | ·00004    | ·00005    | 45                          | 52    | 1729·9    | 15482·0   | 96                           | 103   | ·00002    | ·00002    |
| 46                          | 52    | 1648·9    | 14664·7   | 97                           | 103   | ·00001    | ·00001    | 46                          | 53    | 1564·6    | 13752·1   | 97                           | 104   | ·00000    | ·00000    |
| 47                          | 53    | 1490·6    | 13015·8   | 98                           | 104   | ·00000    | ·00000    | 47                          | 54    | 1413·1    | 12187·5   | 98                           | 105   | ·00000    | ·00000    |
| 48                          | 54    | 1345·6    | 11525·2   | 99                           | 105   | ·00000    | ·00000    | 48                          | 55    | 1274·3    | 10774·4   | 99                           | 106   | ·00000    | ·00000    |
| 49                          | 55    | 1212·7    | 10179·6   | 100                          | 106   | ·00000    | ·00000    | 49                          | 56    | 1147·2    | 9500·07   | DIFFERENCE OF AGE, 89 YEARS. |       |           |           |
| 50                          | 56    | 1091·1    | 8966·88   | DIFFERENCE OF AGE, 90 YEARS. |       |           |           | 50                          | 57    | 1030·9    | 8352·87   |                              |       |           |           |
| 51                          | 57    | 979·86    | 7875·78   |                              |       |           |           | 51                          | 58    | 924·59    | 7321·97   | 10                           | 99    | 1·4021    | 3·22519   |
| 52                          | 58    | 878·09    | 6895·92   | 10                           | 100   | ·84715    | 1·89935   | 52                          | 59    | 827·42    | 6397·38   | 11                           | 100   | ·81249    | 1·82309   |
| 53                          | 59    | 785·16    | 6017·83   | 11                           | 101   | ·47128    | 1·05220   | 53                          | 60    | 738·67    | 5569·96   | 12                           | 101   | ·45240    | 1·01060   |
| 54                          | 60    | 700·29    | 5232·67   | 12                           | 102   | ·27074    | ·58092    | 54                          | 61    | 657·71    | 4831·29   | 13                           | 102   | ·26008    | ·55820    |
| 55                          | 61    | 622·89    | 4532·38   | 13                           | 103   | ·15473    | ·31018    | 55                          | 62    | 583·86    | 4173·58   | 14                           | 103   | ·14870    | ·29812    |
| 56                          | 62    | 552·33    | 3909·49   | 14                           | 104   | ·08985    | ·15545    | 56                          | 63    | 516·65    | 3589·72   | 15                           | 104   | ·08636    | ·14942    |
| 57                          | 63    | 488·17    | 3357·16   | 15                           | 105   | ·05009    | ·06560    | 57                          | 64    | 455·54    | 3073·07   | 16                           | 105   | ·04815    | ·06306    |
| 58                          | 64    | 429·85    | 2868·99   | 16                           | 106   | ·01551    | ·01551    | 58                          | 65    | 400·09    | 2617·53   | 17                           | 106   | ·01491    | ·01491    |
| 59                          | 65    | 377·00    | 2439·14   |                              |       |           |           | 59                          | 66    | 349·90    | 2217·44   |                              |       |           |           |
| 60                          | 66    | 329·18    | 2062·14   |                              |       |           |           | 60                          | 67    | 304·59    | 1867·54   |                              |       |           |           |

90 YEARS.

7 B

89 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 8 YEARS. |    |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 9 YEARS. |    |                  |                  |                              |     |                  |                  |
|-----------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|-----------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                       |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                       |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                          | y. |                  |                  | x.                           | y.  |                  |                  | x.                          | y. |                  |                  | x.                           | y.  |                  |                  |
| 10                          | 18 | 36828            | 445445           | 61                           | 69  | 242.42           | 1402.71          | 10                          | 19 | 35351            | 426177           | 61                           | 70  | 221.87           | 1252.20          |
| 11                          | 19 | 33904            | 408617           | 62                           | 70  | 207.97           | 1160.29          | 11                          | 20 | 32531            | 390826           | 62                           | 71  | 189.52           | 1030.33          |
| 12                          | 20 | 31228            | 374713           | 63                           | 71  | 177.28           | 952.324          | 12                          | 21 | 29953            | 358295           | 63                           | 72  | 160.76           | 840.807          |
| 13                          | 21 | 28773            | 343485           | 64                           | 72  | 150.01           | 775.044          | 13                          | 22 | 27589            | 328342           | 64                           | 73  | 135.33           | 680.047          |
| 14                          | 22 | 26515            | 314712           | 65                           | 73  | 125.96           | 625.034          | 14                          | 23 | 25416            | 300753           | 65                           | 74  | 112.95           | 544.717          |
| 15                          | 23 | 24430            | 288197           | 66                           | 74  | 104.83           | 499.074          | 15                          | 24 | 23411            | 275337           | 66                           | 75  | 93.405           | 431.767          |
| 16                          | 24 | 22501            | 263767           | 67                           | 75  | 86.428           | 394.244          | 16                          | 25 | 21555            | 251926           | 67                           | 76  | 76.450           | 338.362          |
| 17                          | 25 | 20708            | 241266           | 68                           | 76  | 70.501           | 307.816          | 17                          | 26 | 19832            | 230371           | 68                           | 77  | 61.873           | 261.912          |
| 18                          | 26 | 19045            | 220558           | 69                           | 77  | 56.856           | 237.315          | 18                          | 27 | 18234            | 210539           | 69                           | 78  | 49.446           | 200.039          |
| 19                          | 27 | 17503            | 201513           | 70                           | 78  | 45.254           | 180.459          | 19                          | 28 | 16755            | 192305           | 70                           | 79  | 38.970           | 150.593          |
| 20                          | 28 | 16076            | 184010           | 71                           | 79  | 35.513           | 135.205          | 20                          | 29 | 15386            | 175550           | 71                           | 80  | 30.247           | 111.623          |
| 21                          | 29 | 14758            | 167934           | 72                           | 80  | 27.429           | 99.6922          | 21                          | 30 | 14123            | 160164           | 72                           | 81  | 23.098           | 81.3756          |
| 22                          | 30 | 13542            | 153176           | 73                           | 81  | 20.837           | 72.2632          | 22                          | 31 | 12957            | 146041           | 73                           | 82  | 17.329           | 58.2776          |
| 23                          | 31 | 12420            | 139634           | 74                           | 82  | 15.539           | 51.4262          | 23                          | 32 | 11883            | 133084           | 74                           | 83  | 12.760           | 40.9486          |
| 24                          | 32 | 11387            | 127214           | 75                           | 83  | 11.370           | 35.8872          | 24                          | 33 | 10893            | 121201           | 75                           | 84  | 9.2109           | 28.1886          |
| 25                          | 33 | 10435            | 115827           | 76                           | 84  | 8.1474           | 24.5172          | 25                          | 34 | 9980.4           | 110309           | 76                           | 85  | 6.5061           | 18.9777          |
| 26                          | 34 | 9558.0           | 105393           | 77                           | 85  | 5.7098           | 16.3698          | 26                          | 35 | 9140.5           | 100329           | 77                           | 86  | 4.4866           | 12.4716          |
| 27                          | 35 | 8751.6           | 95834.6          | 78                           | 86  | 3.9019           | 10.6600          | 27                          | 36 | 8367.8           | 91188.1          | 78                           | 87  | 3.0143           | 7.98496          |
| 28                          | 36 | 8010.2           | 87083.0          | 79                           | 87  | 2.5957           | 6.75809          | 28                          | 37 | 7657.5           | 82820.3          | 79                           | 88  | 1.9631           | 4.97066          |
| 29                          | 37 | 7328.9           | 79072.8          | 80                           | 88  | 1.6720           | 4.16239          | 29                          | 38 | 7004.8           | 75162.8          | 80                           | 89  | 1.2431           | 3.00756          |
| 30                          | 38 | 6703.3           | 71743.9          | 81                           | 89  | 1.0468           | 2.49039          | 30                          | 39 | 6405.4           | 68158.0          | 81                           | 90  | .76209           | 1.76446          |
| 31                          | 39 | 6128.9           | 65040.6          | 82                           | 90  | .63382           | 1.44359          | 31                          | 40 | 5854.9           | 61752.6          | 82                           | 91  | .45165           | 1.00237          |
| 32                          | 40 | 5601.5           | 58911.7          | 83                           | 91  | .37088           | .80977           | 32                          | 41 | 5349.5           | 55897.7          | 83                           | 92  | .25853           | .55072           |
| 33                          | 41 | 5117.4           | 53310.2          | 84                           | 92  | .20943           | .43889           | 33                          | 42 | 4885.6           | 50548.2          | 84                           | 93  | .14258           | .29219           |
| 34                          | 42 | 4672.8           | 48192.8          | 85                           | 93  | .11386           | .22946           | 34                          | 43 | 4459.6           | 45662.6          | 85                           | 94  | .07578           | .14961           |
| 35                          | 43 | 4264.8           | 43520.0          | 86                           | 94  | .05954           | .11560           | 35                          | 44 | 4068.5           | 41203.0          | 86                           | 95  | .03872           | .07383           |
| 36                          | 44 | 3890.1           | 39255.2          | 87                           | 95  | .02991           | .05606           | 36                          | 45 | 3709.5           | 37134.5          | 87                           | 96  | .01902           | .03511           |
| 37                          | 45 | 3546.2           | 35365.1          | 88                           | 96  | .01438           | .02615           | 37                          | 46 | 3380.0           | 33425.0          | 88                           | 97  | .00895           | .01609           |
| 38                          | 46 | 3230.5           | 31818.9          | 89                           | 97  | .00666           | .01177           | 38                          | 47 | 3077.7           | 30045.0          | 89                           | 98  | .00406           | .00714           |
| 39                          | 47 | 2940.9           | 28588.4          | 90                           | 98  | .00296           | .00511           | 39                          | 48 | 2800.3           | 26967.3          | 90                           | 99  | .00180           | .00308           |
| 40                          | 48 | 2675.0           | 25647.5          | 91                           | 99  | .00128           | .00215           | 40                          | 49 | 2545.7           | 24167.0          | 91                           | 100 | .00077           | .00128           |
| 41                          | 49 | 2432.1           | 22972.5          | 92                           | 100 | .00054           | .00087           | 41                          | 50 | 2312.2           | 21621.3          | 92                           | 101 | .00031           | .00051           |
| 42                          | 50 | 2207.5           | 20540.4          | 93                           | 101 | .00021           | .00033           | 42                          | 51 | 2098.1           | 19309.1          | 93                           | 102 | .00013           | .00020           |
| 43                          | 51 | 2002.4           | 18332.9          | 94                           | 102 | .00008           | .00012           | 43                          | 52 | 1901.7           | 17211.0          | 94                           | 103 | .00005           | .00007           |
| 44                          | 52 | 1814.2           | 16330.5          | 95                           | 103 | .00003           | .00004           | 44                          | 53 | 1721.5           | 15309.3          | 95                           | 104 | .00002           | .00002           |
| 45                          | 53 | 1641.6           | 14516.3          | 96                           | 104 | .00001           | .00001           | 45                          | 54 | 1556.3           | 13587.8          | 96                           | 105 | .00000           | .00000           |
| 46                          | 54 | 1483.3           | 12874.7          | 97                           | 105 | .00000           | .00000           | 46                          | 55 | 1404.8           | 12031.5          | 97                           | 106 | .00000           | .00000           |
| 47                          | 55 | 1338.3           | 11391.4          | 98                           | 106 | .00000           | .00000           | 47                          | 56 | 1266.0           | 10626.7          | DIFFERENCE OF AGE, 87 YEARS. |     |                  |                  |
| 48                          | 56 | 1205.5           | 10053.1          | DIFFERENCE OF AGE, 88 YEARS. |     |                  |                  | 48                          | 57 | 1139.1           | 93606.6          |                              |     |                  |                  |
| 49                          | 57 | 1084.0           | 8847.66          |                              |     |                  |                  | 49                          | 58 | 1022.8           | 8221.56          | 10                           | 97  | 3.7773           | 8.96124          |
| 50                          | 58 | 972.80           | 7763.66          | 10                           | 98  | 2.3050           | 5.40068          | 50                          | 59 | 916.66           | 7198.76          | 11                           | 98  | 2.2107           | 5.18394          |
| 51                          | 59 | 871.23           | 6790.86          | 11                           | 99  | 1.3447           | 3.09568          | 51                          | 60 | 819.66           | 6282.10          | 12                           | 99  | 1.2908           | 2.97324          |
| 52                          | 60 | 778.43           | 5919.63          | 12                           | 100 | .77994           | 1.75098          | 52                          | 61 | 731.10           | 5462.44          | 13                           | 100 | .74924           | 1.68244          |
| 53                          | 61 | 693.76           | 5141.20          | 13                           | 101 | .43459           | .97104           | 53                          | 62 | 650.30           | 4731.34          | 14                           | 101 | .41766           | .93320           |
| 54                          | 62 | 616.50           | 4447.44          | 14                           | 102 | .24995           | .53645           | 54                          | 63 | 576.67           | 4081.04          | 15                           | 102 | .24026           | .51554           |
| 55                          | 63 | 546.14           | 3830.94          | 15                           | 103 | .14293           | .28650           | 55                          | 64 | 509.64           | 3504.37          | 16                           | 103 | .13738           | .27528           |
| 56                          | 64 | 482.11           | 3284.80          | 16                           | 104 | .08300           | .14357           | 56                          | 65 | 448.74           | 2994.73          | 17                           | 104 | .07974           | .13790           |
| 57                          | 65 | 424.01           | 2802.69          | 17                           | 105 | .04626           | .06057           | 57                          | 66 | 393.52           | 2545.99          | 18                           | 105 | .04442           | .05816           |
| 58                          | 66 | 371.32           | 2378.68          | 18                           | 106 | .01431           | .01431           | 58                          | 67 | 343.59           | 2152.47          | 19                           | 106 | .01374           | .01374           |
| 59                          | 67 | 323.76           | 2007.36          |                              |     |                  |                  | 59                          | 68 | 298.57           | 1808.88          |                              |     |                  |                  |
| 60                          | 68 | 280.89           | 1683.60          |                              |     |                  |                  | 60                          | 69 | 258.11           | 1510.31          |                              |     |                  |                  |

88 YEARS.

87 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 10 YEARS. |    |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 11 YEARS. |    |                  |                  |                              |     |                  |                  |
|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                           | y. |                  |                  | x.                           | y.  |                  |                  | x.                           | y. |                  |                  | x.                           | y.  |                  |                  |
| 10                           | 20 | 33919            | 407608           | 61                           | 71  | 202·19           | 1111·41          | 10                           | 21 | 32533            | 389743           | 61                           | 72  | 183·35           | 980·322          |
| 11                           | 21 | 31202            | 373689           | 62                           | 72  | 171·86           | 909·215          | 11                           | 22 | 29919            | 357210           | 62                           | 73  | 155·04           | 796·972          |
| 12                           | 22 | 28720            | 342487           | 63                           | 73  | 145·02           | 737·355          | 12                           | 23 | 27531            | 327291           | 63                           | 74  | 130·04           | 641·932          |
| 13                           | 23 | 26446            | 313767           | 64                           | 74  | 121·35           | 592·335          | 13                           | 24 | 25343            | 299760           | 64                           | 75  | 108·13           | 511·892          |
| 14                           | 24 | 24355            | 287321           | 65                           | 75  | 100·64           | 470·985          | 14                           | 25 | 23331            | 274417           | 65                           | 76  | 89·022           | 403·762          |
| 15                           | 25 | 22427            | 262966           | 66                           | 76  | 82·621           | 370·345          | 15                           | 26 | 21478            | 251086           | 66                           | 77  | 72·510           | 314·740          |
| 16                           | 26 | 20643            | 240539           | 67                           | 77  | 67·094           | 287·724          | 16                           | 27 | 19764            | 229608           | 67                           | 78  | 58·350           | 242·230          |
| 17                           | 27 | 18988            | 219896           | 68                           | 78  | 53·809           | 220·630          | 17                           | 28 | 18177            | 209844           | 68                           | 79  | 46·338           | 183·880          |
| 18                           | 28 | 17455            | 200908           | 69                           | 79  | 42·580           | 166·821          | 18                           | 29 | 16706            | 191677           | 69                           | 80  | 36·266           | 137·542          |
| 19                           | 29 | 16036            | 183453           | 70                           | 80  | 33·191           | 124·241          | 19                           | 30 | 15346            | 174961           | 70                           | 81  | 27·951           | 101·276          |
| 20                           | 30 | 14724            | 167417           | 71                           | 81  | 25·471           | 91·0501          | 20                           | 31 | 14089            | 159615           | 71                           | 82  | 21·184           | 73·3255          |
| 21                           | 31 | 13513            | 152693           | 72                           | 82  | 19·210           | 65·5791          | 21                           | 32 | 12928            | 145526           | 72                           | 83  | 15·775           | 52·1415          |
| 22                           | 32 | 12396            | 139180           | 73                           | 83  | 14·230           | 46·3691          | 22                           | 33 | 11858            | 132598           | 73                           | 84  | 11·528           | 36·3665          |
| 23                           | 33 | 11367            | 126784           | 74                           | 84  | 10·337           | 32·1391          | 23                           | 34 | 10872            | 120740           | 74                           | 85  | 8·2546           | 24·8385          |
| 24                           | 34 | 10418            | 115417           | 75                           | 85  | 7·3552           | 21·8021          | 24                           | 35 | 9963·2           | 109868           | 75                           | 86  | 5·7795           | 16·5839          |
| 25                           | 35 | 9544·4           | 104999           | 76                           | 86  | 5·1123           | 14·4469          | 25                           | 36 | 9125·8           | 99905·2          | 76                           | 87  | 3·9493           | 10·8044          |
| 26                           | 36 | 8739·7           | 95454·4          | 77                           | 87  | 3·4660           | 9·33458          | 26                           | 37 | 8354·9           | 90779·4          | 77                           | 88  | 2·6213           | 6·85507          |
| 27                           | 37 | 7999·4           | 86714·7          | 78                           | 88  | 2·2797           | 5·86858          | 27                           | 38 | 7645·7           | 82424·5          | 78                           | 89  | 1·6949           | 4·23377          |
| 28                           | 38 | 7318·9           | 78715·3          | 79                           | 89  | 1·4596           | 3·58888          | 28                           | 39 | 6993·6           | 74778·8          | 79                           | 90  | 1·0625           | 2·53887          |
| 29                           | 39 | 6693·5           | 71396·4          | 80                           | 90  | ·90498           | 2·12928          | 29                           | 40 | 6394·2           | 67785·2          | 80                           | 91  | ·64488           | 1·47637          |
| 30                           | 40 | 6119·0           | 64702·9          | 81                           | 91  | ·54306           | 1·22430          | 30                           | 41 | 5843·8           | 61391·0          | 81                           | 92  | ·37855           | ·83149           |
| 31                           | 41 | 5591·6           | 58583·9          | 82                           | 92  | ·31483           | ·68124           | 31                           | 42 | 5338·3           | 55547·2          | 82                           | 93  | ·21433           | ·45294           |
| 32                           | 42 | 5107·2           | 52992·3          | 83                           | 93  | ·17600           | ·36641           | 32                           | 43 | 4874·1           | 50208·9          | 83                           | 94  | ·11714           | ·23861           |
| 33                           | 43 | 4662·7           | 47885·1          | 84                           | 94  | ·09489           | ·19041           | 33                           | 44 | 4448·1           | 45334·8          | 84                           | 95  | ·06171           | ·12147           |
| 34                           | 44 | 4248·1           | 43222·4          | 85                           | 95  | ·04928           | ·09552           | 34                           | 45 | 4056·9           | 40886·7          | 85                           | 96  | ·03133           | ·05976           |
| 35                           | 45 | 3879·6           | 38974·3          | 86                           | 96  | ·02462           | ·04624           | 35                           | 46 | 3697·8           | 36829·8          | 86                           | 97  | ·01532           | ·02843           |
| 36                           | 46 | 3535·7           | 35094·7          | 87                           | 97  | ·01184           | ·02162           | 36                           | 47 | 3368·4           | 33132·0          | 87                           | 98  | ·00722           | ·01311           |
| 37                           | 47 | 3220·1           | 31559·0          | 88                           | 98  | ·00546           | ·00978           | 37                           | 48 | 3066·1           | 29763·6          | 88                           | 99  | ·00332           | ·00589           |
| 38                           | 48 | 2930·5           | 28338·9          | 89                           | 99  | ·00247           | ·00432           | 38                           | 49 | 2788·8           | 26697·5          | 89                           | 100 | ·00149           | ·00257           |
| 39                           | 49 | 2664·9           | 25408·4          | 90                           | 100 | ·00109           | ·00185           | 39                           | 50 | 2534·5           | 23908·7          | 90                           | 101 | ·00063           | ·00103           |
| 40                           | 50 | 2421·2           | 22743·5          | 91                           | 101 | ·00045           | ·00076           | 40                           | 51 | 2301·2           | 21374·2          | 91                           | 102 | ·00027           | ·00045           |
| 41                           | 51 | 2197·7           | 20322·3          | 92                           | 102 | ·00019           | ·00031           | 41                           | 52 | 2087·1           | 19073·0          | 92                           | 103 | ·00011           | ·00018           |
| 42                           | 52 | 1992·6           | 18124·6          | 93                           | 103 | ·00008           | ·00012           | 42                           | 53 | 1890·8           | 16985·9          | 93                           | 104 | ·00005           | ·00007           |
| 43                           | 53 | 1804·5           | 16132·0          | 94                           | 104 | ·00003           | ·00004           | 43                           | 54 | 1710·8           | 15095·1          | 94                           | 105 | ·00002           | ·00002           |
| 44                           | 54 | 1632·0           | 14327·5          | 95                           | 105 | ·00001           | ·00001           | 44                           | 55 | 1545·6           | 13384·3          | 95                           | 106 | ·00000           | ·00000           |
| 45                           | 55 | 1473·9           | 12695·5          | 96                           | 106 | ·00000           | ·00000           | 45                           | 56 | 1394·3           | 11838·7          | DIFFERENCE OF AGE, 85 YEARS. |     |                  |                  |
| 46                           | 56 | 1328·9           | 11221·6          | DIFFERENCE OF AGE, 86 YEARS. |     |                  |                  | 46                           | 57 | 1255·7           | 10444·4          |                              |     |                  |                  |
| 47                           | 57 | 1196·3           | 9892·66          |                              |     |                  |                  | 47                           | 58 | 1128·8           | 9188·71          | 10                           | 95  | 9·5454           | 23·6095          |
| 48                           | 58 | 1074·3           | 8696·36          | 10                           | 96  | 6·0688           | 14·6705          | 48                           | 59 | 1012·8           | 8059·91          | 11                           | 96  | 5·8025           | 14·0641          |
| 49                           | 59 | 963·32           | 7621·56          | 11                           | 97  | 3·6228           | 8·60170          | 49                           | 60 | 906·76           | 7047·11          | 12                           | 97  | 3·4777           | 8·26164          |
| 50                           | 60 | 862·39           | 6657·74          | 12                           | 98  | 2·1221           | 4·97890          | 50                           | 61 | 809·95           | 6140·35          | 13                           | 98  | 2·0386           | 4·78394          |
| 51                           | 61 | 769·82           | 5795·35          | 13                           | 99  | 1·2400           | 2·85680          | 51                           | 62 | 721·59           | 5330·41          | 14                           | 99  | 1·1917           | 2·74534          |
| 52                           | 62 | 685·30           | 5025·53          | 14                           | 100 | ·72005           | 1·61680          | 52                           | 63 | 641·03           | 4608·81          | 15                           | 100 | ·69213           | 1·55364          |
| 53                           | 63 | 603·28           | 4340·23          | 15                           | 101 | ·40146           | ·89675           | 53                           | 64 | 567·63           | 3967·78          | 16                           | 101 | ·38586           | ·86151           |
| 54                           | 64 | 538·13           | 3731·95          | 16                           | 102 | ·23091           | ·49529           | 54                           | 65 | 500·88           | 3400·15          | 17                           | 102 | ·22185           | ·47565           |
| 55                           | 65 | 474·36           | 3193·82          | 17                           | 103 | ·13198           | ·26438           | 55                           | 66 | 440·25           | 2899·27          | 18                           | 103 | ·12674           | ·25380           |
| 56                           | 66 | 416·48           | 2719·46          | 18                           | 104 | ·07658           | ·13240           | 56                           | 67 | 385·37           | 2459·02          | 19                           | 104 | ·07351           | ·12706           |
| 57                           | 67 | 364·13           | 2302·98          | 19                           | 105 | ·04264           | ·05582           | 57                           | 68 | 335·79           | 2073·65          | 20                           | 105 | ·04091           | ·05355           |
| 58                           | 68 | 316·85           | 1938·85          | 20                           | 106 | ·01318           | ·01318           | 58                           | 69 | 291·16           | 1737·86          | 21                           | 106 | ·01264           | ·01264           |
| 59                           | 69 | 274·36           | 1622·00          |                              |     |                  |                  | 59                           | 70 | 251·10           | 1446·70          |                              |     |                  |                  |
| 60                           | 70 | 236·23           | 1347·64          |                              |     |                  |                  | 60                           | 71 | 215·28           | 1195·60          |                              |     |                  |                  |

86 YEARS.

85 YEARS.



TABLE 14—(continued).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

| DIFFERENCE OF AGE, 12 YEARS. |    |                   |                   |                              |     |                   |                   | DIFFERENCE OF AGE, 13 YEARS. |    |                   |                   |                              |     |                   |                   |
|------------------------------|----|-------------------|-------------------|------------------------------|-----|-------------------|-------------------|------------------------------|----|-------------------|-------------------|------------------------------|-----|-------------------|-------------------|
| Ages.                        |    | D <sub>x, y</sub> | N <sub>x, y</sub> | Ages.                        |     | D <sub>x, y</sub> | N <sub>x, y</sub> | Ages.                        |    | D <sub>x, y</sub> | N <sub>x, y</sub> | Ages.                        |     | D <sub>x, y</sub> | N <sub>x, y</sub> |
| x.                           | y. |                   |                   | x.                           | y.  |                   |                   | x.                           | y. |                   |                   | x.                           | y.  |                   |                   |
| 10                           | 22 | 31195             | 372540            | 61                           | 73  | 165.40            | 858.879           | 10                           | 23 | 29902             | 355988            | 61                           | 74  | 148.31            | 747.008           |
| 11                           | 23 | 28679             | 341345            | 62                           | 74  | 139.02            | 693.479           | 11                           | 24 | 27482             | 326086            | 62                           | 75  | 123.87            | 598.698           |
| 12                           | 24 | 26382             | 312666            | 63                           | 75  | 115.87            | 554.459           | 12                           | 25 | 25272             | 298604            | 63                           | 76  | 102.49            | 474.828           |
| 13                           | 25 | 24277             | 286284            | 64                           | 76  | 95.642            | 438.589           | 13                           | 26 | 23250             | 273332            | 64                           | 77  | 83.938            | 372.338           |
| 14                           | 26 | 22344             | 262007            | 65                           | 77  | 78.128            | 342.947           | 14                           | 27 | 21393             | 250082            | 65                           | 78  | 67.946            | 288.400           |
| 15                           | 27 | 20564             | 239663            | 66                           | 78  | 63.060            | 264.819           | 15                           | 28 | 19685             | 228689            | 66                           | 79  | 54.304            | 220.454           |
| 16                           | 28 | 18920             | 219099            | 67                           | 79  | 50.248            | 201.759           | 16                           | 29 | 18108             | 209004            | 67                           | 80  | 42.797            | 166.150           |
| 17                           | 29 | 17396             | 200179            | 68                           | 80  | 39.466            | 151.511           | 17                           | 30 | 16648             | 190896            | 68                           | 81  | 33.235            | 123.353           |
| 18                           | 30 | 15987             | 182783            | 69                           | 81  | 30.540            | 112.045           | 18                           | 31 | 15297             | 174248            | 69                           | 82  | 25.399            | 90.1178           |
| 19                           | 31 | 14683             | 166796            | 70                           | 82  | 23.246            | 81.5053           | 19                           | 32 | 14048             | 158951            | 70                           | 83  | 19.089            | 64.7188           |
| 20                           | 32 | 13479             | 152113            | 71                           | 83  | 17.395            | 58.2593           | 20                           | 33 | 12894             | 144903            | 71                           | 84  | 14.092            | 45.6298           |
| 21                           | 33 | 12367             | 138634            | 72                           | 84  | 12.779            | 40.8643           | 21                           | 34 | 11829             | 132009            | 72                           | 85  | 10.205            | 31.5378           |
| 22                           | 34 | 11342             | 126267            | 73                           | 85  | 9.2055            | 28.0853           | 22                           | 35 | 10847             | 120180            | 73                           | 86  | 7.2334            | 21.3328           |
| 23                           | 35 | 10397             | 114925            | 74                           | 86  | 6.4862            | 18.8798           | 23                           | 36 | 9941.2            | 109333            | 74                           | 87  | 5.0107            | 14.0994           |
| 24                           | 36 | 9526.4            | 104528            | 75                           | 87  | 4.4648            | 12.3936           | 24                           | 37 | 9106.9            | 99392.0           | 75                           | 88  | 3.3767            | 9.08869           |
| 25                           | 37 | 8724.1            | 95001.5           | 76                           | 88  | 2.9868            | 7.92883           | 25                           | 38 | 8338.3            | 90285.1           | 76                           | 89  | 2.2207            | 5.71199           |
| 26                           | 38 | 7985.4            | 86277.4           | 77                           | 89  | 1.9489            | 4.94203           | 26                           | 39 | 7630.5            | 81946.8           | 77                           | 90  | 1.4188            | 3.49129           |
| 27                           | 39 | 7305.9            | 78292.0           | 78                           | 90  | 1.2339            | 2.99313           | 27                           | 40 | 6979.2            | 74316.3           | 78                           | 91  | .87925            | 2.07249           |
| 28                           | 40 | 6680.9            | 70986.1           | 79                           | 91  | .75717            | 1.75923           | 28                           | 41 | 6380.4            | 67337.1           | 79                           | 92  | .52779            | 1.19324           |
| 29                           | 41 | 6106.6            | 64305.2           | 80                           | 92  | .44952            | 1.00206           | 29                           | 42 | 5829.9            | 60956.7           | 80                           | 93  | .30603            | .66545            |
| 30                           | 42 | 5579.0            | 58198.6           | 81                           | 93  | .25771            | .55254            | 30                           | 43 | 5324.5            | 55126.8           | 81                           | 94  | .17152            | .35942            |
| 31                           | 43 | 5094.7            | 52619.6           | 82                           | 94  | .14265            | .29483            | 31                           | 44 | 4860.2            | 49802.3           | 82                           | 95  | .09277            | .18790            |
| 32                           | 44 | 4649.9            | 47524.9           | 83                           | 95  | .07618            | .15218            | 32                           | 45 | 4434.0            | 44942.1           | 83                           | 96  | .04843            | .09513            |
| 33                           | 45 | 4241.5            | 42875.0           | 84                           | 96  | .03924            | .07600            | 33                           | 46 | 4042.8            | 40508.1           | 84                           | 97  | .02442            | .04670            |
| 34                           | 46 | 3866.7            | 38633.5           | 85                           | 97  | .01950            | .03676            | 34                           | 47 | 3683.8            | 36465.3           | 85                           | 98  | .01190            | .02228            |
| 35                           | 47 | 3522.8            | 34766.8           | 86                           | 98  | .00935            | .01726            | 35                           | 48 | 3354.4            | 32781.5           | 86                           | 99  | .00569            | .01038            |
| 36                           | 48 | 3207.3            | 31244.0           | 87                           | 99  | .00439            | .00791            | 36                           | 49 | 3052.2            | 29427.1           | 87                           | 100 | .00265            | .00469            |
| 37                           | 49 | 2917.9            | 28036.7           | 88                           | 100 | .00201            | .00352            | 37                           | 50 | 2775.1            | 26374.9           | 88                           | 101 | .00117            | .00204            |
| 38                           | 50 | 2652.4            | 25118.8           | 89                           | 101 | .00087            | .00151            | 38                           | 51 | 2520.9            | 23599.8           | 89                           | 102 | .00052            | .00087            |
| 39                           | 51 | 2408.9            | 22466.4           | 90                           | 102 | .00038            | .00064            | 39                           | 52 | 2286.7            | 21078.9           | 90                           | 103 | .00022            | .00035            |
| 40                           | 52 | 2185.4            | 20057.5           | 91                           | 103 | .00016            | .00026            | 40                           | 53 | 2073.8            | 18792.2           | 91                           | 104 | .00009            | .00013            |
| 41                           | 53 | 1980.5            | 17872.1           | 92                           | 104 | .00007            | .00010            | 41                           | 54 | 1877.6            | 16718.4           | 92                           | 105 | .00004            | .00004            |
| 42                           | 54 | 1792.6            | 15891.6           | 93                           | 105 | .00003            | .00003            | 42                           | 55 | 1697.7            | 14840.8           | 93                           | 106 | .00000            | .00000            |
| 43                           | 55 | 1620.2            | 14099.0           | 94                           | 106 | .00000            | .00000            | 43                           | 56 | 1532.7            | 13143.1           | DIFFERENCE OF AGE, 83 YEARS. |     |                   |                   |
| 44                           | 56 | 1462.2            | 12478.8           | DIFFERENCE OF AGE, 84 YEARS. |     |                   |                   | 44                           | 57 | 1381.6            | 11610.4           |                              |     |                   |                   |
| 45                           | 57 | 1317.4            | 11016.6           |                              |     |                   |                   | 45                           | 58 | 1243.1            | 10228.8           | 10                           | 93  | 22.053            | 57.9136           |
| 46                           | 58 | 1184.9            | 9699.22           | 10                           | 94  | 14.677            | 37.3573           | 46                           | 59 | 1116.5            | 8985.73           | 11                           | 94  | 14.077            | 35.8606           |
| 47                           | 59 | 1063.6            | 8514.32           | 11                           | 95  | 9.1549            | 22.6803           | 47                           | 60 | 1000.7            | 7869.23           | 12                           | 95  | 8.7882            | 21.7836           |
| 48                           | 60 | 952.83            | 7450.72           | 12                           | 96  | 5.5874            | 13.5254           | 48                           | 61 | 894.89            | 6868.53           | 13                           | 96  | 5.3674            | 12.9954           |
| 49                           | 61 | 851.63            | 6497.89           | 13                           | 97  | 3.3408            | 7.93801           | 49                           | 62 | 798.27            | 5973.64           | 14                           | 97  | 3.2106            | 7.62801           |
| 50                           | 62 | 759.21            | 5646.26           | 14                           | 98  | 1.9592            | 4.59721           | 50                           | 63 | 710.16            | 5175.37           | 15                           | 98  | 1.8832            | 4.41741           |
| 51                           | 63 | 674.97            | 4887.05           | 15                           | 99  | 1.1455            | 2.63801           | 51                           | 64 | 629.86            | 4465.21           | 16                           | 99  | 1.1010            | 2.53421           |
| 52                           | 64 | 598.18            | 4212.08           | 16                           | 100 | .66522            | 1.49251           | 52                           | 65 | 556.78            | 3835.35           | 17                           | 100 | .63910            | 1.43321           |
| 53                           | 65 | 528.34            | 3613.90           | 17                           | 101 | .37070            | .82729            | 53                           | 66 | 490.35            | 3278.57           | 18                           | 101 | .35599            | .79411            |
| 54                           | 66 | 464.86            | 3085.56           | 18                           | 102 | .21304            | .45659            | 54                           | 67 | 430.14            | 2788.22           | 19                           | 102 | .20450            | .43812            |
| 55                           | 67 | 407.37            | 2620.70           | 19                           | 103 | .12166            | .24355            | 55                           | 68 | 375.67            | 2358.08           | 20                           | 103 | .11673            | .23362            |
| 56                           | 68 | 355.38            | 2213.33           | 20                           | 104 | .07053            | .12189            | 56                           | 69 | 326.56            | 1982.41           | 21                           | 104 | .06765            | .11689            |
| 57                           | 69 | 308.56            | 1857.95           | 21                           | 105 | .03924            | .05136            | 57                           | 70 | 282.40            | 1655.85           | 22                           | 105 | .03762            | .04924            |
| 58                           | 70 | 266.47            | 1549.39           | 22                           | 106 | .01212            | .01212            | 58                           | 71 | 242.84            | 1373.45           | 23                           | 106 | .01162            | .01162            |
| 59                           | 71 | 228.82            | 1282.92           |                              |     |                   |                   | 59                           | 72 | 207.50            | 1130.61           |                              |     |                   |                   |
| 60                           | 72 | 195.22            | 1054.10           |                              |     |                   |                   | 60                           | 73 | 176.10            | 923.108           |                              |     |                   |                   |

84 YEARS.

83 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 14 YEARS. |    |           |           |                              |     |           |           | DIFFERENCE OF AGE, 15 YEARS. |    |           |           |                              |     |           |           |
|------------------------------|----|-----------|-----------|------------------------------|-----|-----------|-----------|------------------------------|----|-----------|-----------|------------------------------|-----|-----------|-----------|
| Ages.                        |    | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |     | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |    | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |     | $D_{x,y}$ | $N_{x,y}$ |
| x.                           | y. |           |           | x.                           | y.  |           |           | x.                           | y. |           |           | x.                           | y.  |           |           |
| 10                           | 24 | 28654     | 340068    | 61                           | 75  | 132.15    | 644.623   | 10                           | 25 | 27450     | 324762    | 61                           | 76  | 116.90    | 551.546   |
| 11                           | 25 | 26327     | 311414    | 62                           | 76  | 109.57    | 512.473   | 11                           | 26 | 25213     | 297312    | 62                           | 77  | 96.162    | 434.646   |
| 12                           | 26 | 24203     | 285087    | 63                           | 77  | 89.950    | 402.903   | 12                           | 27 | 23173     | 272099    | 63                           | 78  | 78.227    | 338.484   |
| 13                           | 27 | 22261     | 260884    | 64                           | 78  | 72.998    | 312.953   | 13                           | 28 | 21309     | 248926    | 64                           | 79  | 62.862    | 260.257   |
| 14                           | 28 | 20479     | 238623    | 65                           | 79  | 58.511    | 239.955   | 14                           | 29 | 19600     | 227617    | 65                           | 80  | 49.834    | 197.395   |
| 15                           | 29 | 18840     | 218144    | 66                           | 80  | 46.251    | 181.444   | 15                           | 30 | 18029     | 208017    | 66                           | 81  | 38.949    | 147.561   |
| 16                           | 30 | 17328     | 199304    | 67                           | 81  | 36.039    | 135.193   | 16                           | 31 | 16581     | 189988    | 67                           | 82  | 29.973    | 108.612   |
| 17                           | 31 | 15929     | 181976    | 68                           | 82  | 27.641    | 99.1540   | 17                           | 32 | 15240     | 173407    | 68                           | 83  | 22.897    | 78.6388   |
| 18                           | 32 | 14635     | 166047    | 69                           | 83  | 20.857    | 71.5130   | 18                           | 33 | 14000     | 158167    | 69                           | 84  | 16.896    | 55.9418   |
| 19                           | 33 | 13438     | 151412    | 70                           | 84  | 15.464    | 50.6560   | 19                           | 34 | 12853     | 144167    | 70                           | 85  | 12.349    | 39.0458   |
| 20                           | 34 | 12332     | 137974    | 71                           | 85  | 11.253    | 35.1920   | 20                           | 35 | 11794     | 131314    | 71                           | 86  | 8.8424    | 26.6968   |
| 21                           | 35 | 11312     | 125642    | 72                           | 86  | 8.0186    | 23.9390   | 21                           | 36 | 10816     | 119520    | 72                           | 87  | 6.1945    | 17.8544   |
| 22                           | 36 | 10371     | 114330    | 73                           | 87  | 5.5879    | 15.9204   | 22                           | 37 | 9914.3    | 108705    | 73                           | 88  | 4.2261    | 11.6599   |
| 23                           | 37 | 9503.6    | 103959    | 74                           | 88  | 3.7895    | 10.3325   | 23                           | 38 | 9083.3    | 98790.5   | 74                           | 89  | 2.8175    | 7.43376   |
| 24                           | 38 | 8704.2    | 94455.4   | 75                           | 89  | 2.5105    | 6.54300   | 24                           | 39 | 8317.4    | 89707.2   | 75                           | 90  | 1.8276    | 4.61626   |
| 25                           | 39 | 7967.7    | 85751.2   | 76                           | 90  | 1.6166    | 4.03250   | 25                           | 40 | 7611.4    | 81389.8   | 76                           | 91  | 1.1520    | 2.78866   |
| 26                           | 40 | 7289.3    | 77783.5   | 77                           | 91  | 1.0110    | 2.41590   | 26                           | 41 | 6961.5    | 73778.4   | 77                           | 92  | .70474    | 1.63666   |
| 27                           | 41 | 6665.3    | 70494.2   | 78                           | 92  | .61289    | 1.40490   | 27                           | 42 | 6363.3    | 66816.9   | 78                           | 93  | .41725    | .93192    |
| 28                           | 42 | 6091.4    | 63828.9   | 79                           | 93  | .35931    | .79201    | 28                           | 43 | 5813.4    | 60453.6   | 79                           | 94  | .23914    | .51467    |
| 29                           | 43 | 5563.9    | 57737.5   | 80                           | 94  | .20368    | .43270    | 29                           | 44 | 5307.9    | 54640.2   | 80                           | 95  | .13246    | .27553    |
| 30                           | 44 | 5079.4    | 52173.6   | 81                           | 95  | .11155    | .22902    | 30                           | 45 | 4843.6    | 49332.3   | 81                           | 96  | .07092    | .14307    |
| 31                           | 45 | 4634.6    | 47094.2   | 82                           | 96  | .05898    | .11747    | 31                           | 46 | 4417.4    | 44488.7   | 82                           | 97  | .03671    | .07215    |
| 32                           | 46 | 4226.2    | 42459.6   | 83                           | 97  | .03015    | .05849    | 32                           | 47 | 4026.2    | 40071.3   | 83                           | 98  | .01840    | .03544    |
| 33                           | 47 | 3851.5    | 38233.4   | 84                           | 98  | .01490    | .02834    | 33                           | 48 | 3667.3    | 36045.1   | 84                           | 99  | .00906    | .01704    |
| 34                           | 48 | 3507.6    | 34381.9   | 85                           | 99  | .00724    | .01344    | 34                           | 49 | 3338.0    | 32377.8   | 85                           | 100 | .00437    | .00798    |
| 35                           | 49 | 3192.2    | 30874.3   | 86                           | 100 | .00344    | .00620    | 35                           | 50 | 3036.0    | 29039.8   | 86                           | 101 | .00199    | .00361    |
| 36                           | 50 | 2902.9    | 27682.1   | 87                           | 101 | .00154    | .00276    | 36                           | 51 | 2759.0    | 26003.8   | 87                           | 102 | .00092    | .00162    |
| 37                           | 51 | 2637.6    | 24779.2   | 88                           | 102 | .00070    | .00122    | 37                           | 52 | 2504.9    | 23244.8   | 88                           | 103 | .00041    | .00070    |
| 38                           | 52 | 2394.1    | 22141.6   | 89                           | 103 | .00031    | .00052    | 38                           | 53 | 2271.9    | 20739.9   | 89                           | 104 | .00019    | .00029    |
| 39                           | 53 | 2170.9    | 19747.5   | 90                           | 104 | .00014    | .00021    | 39                           | 54 | 2058.1    | 18468.0   | 90                           | 105 | .00008    | .00010    |
| 40                           | 54 | 1966.0    | 17576.6   | 91                           | 105 | .00006    | .00007    | 40                           | 55 | 1862.0    | 16409.9   | 91                           | 106 | .00002    | .00002    |
| 41                           | 55 | 1778.2    | 15610.6   | 92                           | 106 | .00001    | .00001    | 41                           | 56 | 1682.2    | 14547.9   | DIFFERENCE OF AGE, 81 YEARS. |     |           |           |
| 42                           | 56 | 1606.0    | 13832.4   | DIFFERENCE OF AGE, 82 YEARS. |     |           |           | 42                           | 57 | 1517.5    | 12865.7   |                              |     |           |           |
| 43                           | 57 | 1448.2    | 12226.4   |                              |     |           |           | 43                           | 58 | 1366.5    | 11348.2   | 10                           | 91  | 46.471    | 13.0936   |
| 44                           | 58 | 1303.6    | 10778.2   | 10                           | 92  | 32.393    | 87.9870   | 44                           | 59 | 1228.4    | 9981.73   | 11                           | 92  | 31.068    | 84.4653   |
| 45                           | 59 | 1171.4    | 9474.62   | 11                           | 93  | 21.151    | 55.5940   | 45                           | 60 | 1102.0    | 8753.33   | 12                           | 93  | 20.303    | 53.3973   |
| 46                           | 60 | 1050.4    | 8303.22   | 12                           | 94  | 13.513    | 34.4430   | 46                           | 61 | 986.51    | 7651.33   | 13                           | 94  | 12.981    | 33.0943   |
| 47                           | 61 | 939.83    | 7252.82   | 13                           | 95  | 8.4422    | 20.9300   | 47                           | 62 | 880.95    | 6664.82   | 14                           | 95  | 8.1133    | 20.1133   |
| 48                           | 62 | 838.83    | 6312.99   | 14                           | 96  | 5.1583    | 12.4878   | 48                           | 63 | 784.64    | 5783.87   | 15                           | 96  | 4.9583    | 12.0000   |
| 49                           | 63 | 746.70    | 5474.16   | 15                           | 97  | 3.0861    | 7.32949   | 49                           | 64 | 696.79    | 4999.23   | 16                           | 97  | 2.9661    | 7.04165   |
| 50                           | 64 | 662.70    | 4727.46   | 16                           | 98  | 1.8100    | 4.24339   | 50                           | 65 | 616.83    | 4302.44   | 17                           | 98  | 1.7389    | 4.07555   |
| 51                           | 65 | 586.26    | 4064.76   | 17                           | 99  | 1.0577    | 2.43339   | 51                           | 66 | 544.11    | 3685.61   | 18                           | 99  | 1.0157    | 2.33665   |
| 52                           | 66 | 516.74    | 3478.50   | 18                           | 100 | .61373    | 1.37569   | 52                           | 67 | 478.14    | 3141.50   | 19                           | 100 | .58911    | 1.32095   |
| 53                           | 67 | 453.72    | 2961.76   | 19                           | 101 | .34171    | .76196    | 53                           | 68 | 418.41    | 2663.36   | 20                           | 101 | .32787    | .73184    |
| 54                           | 68 | 396.67    | 2508.04   | 20                           | 102 | .19621    | .42025    | 54                           | 69 | 364.50    | 2244.95   | 21                           | 102 | .18820    | .40397    |
| 55                           | 69 | 345.21    | 2111.37   | 21                           | 103 | .11196    | .22404    | 55                           | 70 | 315.94    | 1880.45   | 22                           | 103 | .10736    | .21577    |
| 56                           | 70 | 298.88    | 1766.16   | 22                           | 104 | .06487    | .11208    | 56                           | 71 | 272.37    | 1564.51   | 23                           | 104 | .06218    | .10841    |
| 57                           | 71 | 257.35    | 1467.28   | 23                           | 105 | .03607    | .04721    | 57                           | 72 | 233.38    | 1292.14   | 24                           | 105 | .03456    | .04623    |
| 58                           | 72 | 220.21    | 1209.93   | 24                           | 106 | .01114    | .01114    | 58                           | 73 | 198.65    | 1058.76   | 25                           | 106 | .01167    | .01167    |
| 59                           | 73 | 187.19    | 989.723   |                              |     |           |           | 59                           | 74 | 167.85    | 860.106   |                              |     |           |           |
| 60                           | 74 | 157.91    | 802.533   |                              |     |           |           | 60                           | 75 | 140.71    | 692.256   |                              |     |           |           |

82 YEARS.

7 C

81 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 16 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 17 YEARS. |       |           |           |                              |       |           |           |
|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                           | 26    | 26288     | 310051    | 61                           | 77    | 102·59    | 467·578   | 10                           | 27    | 25170     | 295912    | 61                           | 78    | 89·220    | 392·479   |
| 11                           | 27    | 24140     | 283763    | 62                           | 78    | 83·630    | 364·988   | 11                           | 28    | 23108     | 270742    | 62                           | 79    | 72·018    | 303·259   |
| 12                           | 28    | 22183     | 259623    | 63                           | 79    | 67·365    | 281·358   | 12                           | 29    | 21231     | 247634    | 63                           | 80    | 57·376    | 231·241   |
| 13                           | 29    | 20395     | 237440    | 64                           | 80    | 53·540    | 213·993   | 13                           | 30    | 19517     | 226403    | 64                           | 81    | 45·087    | 173·865   |
| 14                           | 30    | 18757     | 217045    | 65                           | 81    | 41·966    | 160·453   | 14                           | 31    | 17947     | 206886    | 65                           | 82    | 34·902    | 128·778   |
| 15                           | 31    | 17251     | 198288    | 66                           | 82    | 32·393    | 118·487   | 15                           | 32    | 16505     | 188939    | 66                           | 83    | 26·599    | 93·8760   |
| 16                           | 32    | 15863     | 181037    | 67                           | 83    | 24·613    | 86·0944   | 16                           | 33    | 15174     | 172434    | 67                           | 84    | 19·939    | 67·2770   |
| 17                           | 33    | 14579     | 165174    | 68                           | 84    | 18·387    | 61·4814   | 17                           | 34    | 13944     | 157260    | 68                           | 85    | 14·683    | 47·3380   |
| 18                           | 34    | 13390     | 150595    | 69                           | 85    | 13·492    | 43·0944   | 18                           | 35    | 12805     | 143316    | 69                           | 86    | 10·602    | 32·6550   |
| 19                           | 35    | 12291     | 137205    | 70                           | 86    | 9·7031    | 29·6024   | 19                           | 36    | 11753     | 130511    | 70                           | 87    | 7·4958    | 22·0530   |
| 20                           | 36    | 11277     | 124914    | 71                           | 87    | 6·8309    | 19·8993   | 20                           | 37    | 10780     | 118758    | 71                           | 88    | 5·1661    | 14·5572   |
| 21                           | 37    | 10340     | 113637    | 72                           | 88    | 4·6848    | 13·0684   | 21                           | 38    | 9882·5    | 107978    | 72                           | 89    | 3·4831    | 9·39107   |
| 22                           | 38    | 9475·9    | 103297    | 73                           | 89    | 3·1420    | 8·38360   | 22                           | 39    | 9054·7    | 98095·1   | 73                           | 90    | 2·2874    | 5·90797   |
| 23                           | 39    | 8679·6    | 93820·6   | 74                           | 90    | 2·0511    | 5·24160   | 23                           | 40    | 8291·5    | 89040·4   | 74                           | 91    | 1·4616    | 3·62057   |
| 24                           | 40    | 7945·5    | 85141·0   | 75                           | 91    | 1·3024    | 3·19050   | 24                           | 41    | 7588·1    | 80748·9   | 75                           | 92    | ·90782    | 2·15897   |
| 25                           | 41    | 7269·1    | 77195·5   | 76                           | 92    | ·80301    | 1·88810   | 25                           | 42    | 6939·8    | 73160·8   | 76                           | 93    | ·54668    | 1·25115   |
| 26                           | 42    | 6646·1    | 69926·4   | 77                           | 93    | ·47977    | 1·08509   | 26                           | 43    | 6342·8    | 66221·0   | 77                           | 94    | ·31932    | ·70447    |
| 27                           | 43    | 6073·0    | 63280·3   | 78                           | 94    | ·27770    | ·60532    | 27                           | 44    | 5793·5    | 59878·2   | 78                           | 95    | ·18060    | ·38515    |
| 28                           | 44    | 5545·9    | 57207·3   | 79                           | 95    | ·15553    | ·32762    | 28                           | 45    | 5288·4    | 54084·7   | 79                           | 96    | ·09888    | ·20455    |
| 29                           | 45    | 5061·4    | 51661·4   | 80                           | 96    | ·08421    | ·17209    | 29                           | 46    | 4824·2    | 48796·3   | 80                           | 97    | ·05242    | ·10567    |
| 30                           | 46    | 4616·6    | 46600·0   | 81                           | 97    | ·04414    | ·08788    | 30                           | 47    | 4398·2    | 43972·1   | 81                           | 98    | ·02694    | ·05325    |
| 31                           | 47    | 4208·4    | 41983·4   | 82                           | 98    | ·02240    | ·04374    | 31                           | 48    | 4007·1    | 39573·9   | 82                           | 99    | ·01363    | ·02631    |
| 32                           | 48    | 3833·7    | 37775·0   | 83                           | 99    | ·01119    | ·02134    | 32                           | 49    | 3648·3    | 35566·8   | 83                           | 100   | ·00676    | ·01268    |
| 33                           | 49    | 3490·0    | 33941·3   | 84                           | 100   | ·00548    | ·01015    | 33                           | 50    | 3319·2    | 31918·5   | 84                           | 101   | ·00318    | ·00592    |
| 34                           | 50    | 3174·7    | 30451·3   | 85                           | 101   | ·00254    | ·00467    | 34                           | 51    | 3017·4    | 28599·3   | 85                           | 102   | ·00152    | ·00274    |
| 35                           | 51    | 2885·6    | 27276·6   | 86                           | 102   | ·00119    | ·00213    | 35                           | 52    | 2740·4    | 25581·9   | 86                           | 103   | ·00071    | ·00122    |
| 36                           | 52    | 2620·3    | 24391·0   | 87                           | 103   | ·00055    | ·00094    | 36                           | 53    | 2486·4    | 22841·5   | 87                           | 104   | ·00033    | ·00051    |
| 37                           | 53    | 2377·0    | 21770·7   | 88                           | 104   | ·00025    | ·00039    | 37                           | 54    | 2253·4    | 20355·1   | 88                           | 105   | ·00015    | ·00018    |
| 38                           | 54    | 2153·8    | 19393·7   | 89                           | 105   | ·00011    | ·00014    | 38                           | 55    | 2039·8    | 18101·7   | 89                           | 106   | ·00003    | ·00003    |
| 39                           | 55    | 1949·1    | 17239·9   | 90                           | 106   | ·00003    | ·00003    | 39                           | 56    | 1843·8    | 16061·9   | DIFFERENCE OF AGE, 79 YEARS. |       |           |           |
| 40                           | 56    | 1761·4    | 15290·8   | DIFFERENCE OF AGE, 80 YEARS. |       |           |           | 40                           | 57    | 1664·3    | 14218·1   |                              |       |           |           |
| 41                           | 57    | 1589·5    | 13529·4   |                              |       |           |           | 41                           | 58    | 1499·8    | 12553·8   | 10                           | 89    | 89·580    | 272·858   |
| 42                           | 58    | 1431·9    | 11939·9   | 10                           | 90    | 65·214    | 190·911   | 42                           | 59    | 1349·2    | 11054·0   | 11                           | 90    | 62·546    | 183·278   |
| 43                           | 59    | 1287·7    | 10508·0   | 11                           | 91    | 44·570    | 125·697   | 43                           | 60    | 12·114    | 9704·83   | 12                           | 91    | 42·784    | 120·732   |
| 44                           | 60    | 1155·7    | 9220·31   | 12                           | 92    | 29·823    | 81·1268   | 44                           | 61    | 1085·4    | 8493·43   | 13                           | 92    | 28·649    | 77·9477   |
| 45                           | 61    | 1035·0    | 8064·61   | 13                           | 93    | 19·504    | 51·3038   | 45                           | 62    | 970·18    | 7408·03   | 14                           | 93    | 18·744    | 49·2987   |
| 46                           | 62    | 924·71    | 7029·61   | 14                           | 94    | 12·475    | 31·7998   | 46                           | 63    | 864·97    | 6437·85   | 15                           | 94    | 11·992    | 30·5547   |
| 47                           | 63    | 824·04    | 6104·90   | 15                           | 95    | 7·7987    | 19·3248   | 47                           | 64    | 768·96    | 5572·88   | 16                           | 95    | 7·4955    | 18·5627   |
| 48                           | 64    | 732·19    | 5280·86   | 16                           | 96    | 4·7655    | 11·5261   | 48                           | 65    | 681·51    | 4803·92   | 17                           | 96    | 4·5784    | 11·0672   |
| 49                           | 65    | 648·56    | 4548·67   | 17                           | 97    | 2·8497    | 6·76060   | 49                           | 66    | 601·92    | 4122·41   | 18                           | 97    | 2·7365    | 6·48877   |
| 50                           | 66    | 572·47    | 3900·11   | 18                           | 98    | 1·6699    | 3·91090   | 50                           | 67    | 529·71    | 3520·49   | 19                           | 98    | 1·6029    | 3·75227   |
| 51                           | 67    | 503·46    | 3327·64   | 19                           | 99    | ·97500    | 2·24100   | 51                           | 68    | 464·29    | 2990·78   | 20                           | 99    | ·93551    | 2·14937   |
| 52                           | 68    | 440·94    | 2824·16   | 20                           | 100   | ·56525    | 1·26600   | 52                           | 69    | 405·18    | 2526·49   | 21                           | 100   | ·54216    | 1·21386   |
| 53                           | 69    | 384·48    | 2383·24   | 21                           | 101   | ·31447    | ·70075    | 53                           | 70    | 351·89    | 2121·31   | 22                           | 101   | ·30154    | ·67170    |
| 54                           | 70    | 333·60    | 1998·76   | 22                           | 102   | ·18046    | ·38628    | 54                           | 71    | 304·01    | 1769·42   | 23                           | 102   | ·17298    | ·37016    |
| 55                           | 71    | 287·91    | 1665·16   | 23                           | 103   | ·10291    | ·20582    | 55                           | 72    | 261·09    | 1465·41   | 24                           | 103   | ·09861    | ·19718    |
| 56                           | 72    | 246·99    | 1377·25   | 24                           | 104   | ·05958    | ·10291    | 56                           | 73    | 222·81    | 1204·32   | 25                           | 104   | ·05708    | ·09857    |
| 57                           | 73    | 210·53    | 1130·26   | 25                           | 105   | ·03311    | ·04333    | 57                           | 74    | 188·78    | 981·509   | 26                           | 105   | ·03171    | ·04149    |
| 58                           | 74    | 178·13    | 919·728   | 26                           | 106   | ·01022    | ·01022    | 58                           | 75    | 158·72    | 792·729   | 27                           | 106   | ·00978    | ·00978    |
| 59                           | 75    | 149·56    | 741·598   |                              |       |           |           | 59                           | 76    | 132·30    | 634·009   |                              |       |           |           |
| 60                           | 76    | 124·46    | 592·838   |                              |       |           |           | 60                           | 77    | 109·23    | 501·709   |                              |       |           |           |

80 YEARS.

79 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 18 YEARS. |    |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 19 YEARS. |    |                  |                  |                              |     |                  |                  |
|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                           | y. |                  |                  | x.                           | y.  |                  |                  | x.                           | y. |                  |                  | x.                           | y.  |                  |                  |
| 10                           | 28 | 24094            | 282333           | 61                           | 79  | 76·831           | 325·964          | 10                           | 29 | 23060            | 269180           | 61                           | 80  | 65·438           | 267·686          |
| 11                           | 29 | 22116            | 258239           | 62                           | 80  | 61·338           | 249·133          | 11                           | 30 | 21165            | 246120           | 62                           | 81  | 51·654           | 202·248          |
| 12                           | 30 | 20317            | 236123           | 63                           | 81  | 48·316           | 187·795          | 12                           | 31 | 19440            | 224955           | 63                           | 82  | 40·184           | 150·594          |
| 13                           | 31 | 18675            | 215806           | 64                           | 82  | 37·498           | 139·479          | 13                           | 32 | 17866            | 205515           | 64                           | 83  | 30·792           | 110·410          |
| 14                           | 32 | 17170            | 197131           | 65                           | 83  | 28·660           | 101·981          | 14                           | 33 | 16425            | 187649           | 65                           | 84  | 23·218           | 79·6182          |
| 15                           | 33 | 15788            | 179961           | 66                           | 84  | 21·548           | 73·3214          | 15                           | 34 | 15101            | 171224           | 66                           | 85  | 17·207           | 56·4002          |
| 16                           | 34 | 14514            | 164173           | 67                           | 85  | 15·922           | 51·7734          | 16                           | 35 | 13880            | 156123           | 67                           | 86  | 12·511           | 39·1932          |
| 17                           | 35 | 13335            | 149659           | 68                           | 86  | 11·537           | 35·8514          | 17                           | 36 | 12750            | 142243           | 68                           | 87  | 8·9129           | 26·6822          |
| 18                           | 36 | 12244            | 136324           | 69                           | 87  | 8·1901           | 24·3144          | 18                           | 37 | 11705            | 129493           | 69                           | 88  | 6·1941           | 17·7693          |
| 19                           | 37 | 11235            | 124080           | 70                           | 88  | 5·6690           | 16·1243          | 19                           | 38 | 10638            | 117788           | 70                           | 89  | 4·2148           | 11·5752          |
| 20                           | 38 | 10303            | 112845           | 71                           | 89  | 3·8409           | 10·4553          | 20                           | 39 | 9843·4           | 107150           | 71                           | 90  | 2·7962           | 7·36040          |
| 21                           | 39 | 9443·3           | 102542           | 72                           | 90  | 2·5357           | 6·61439          | 21                           | 40 | 9021·0           | 97306·2          | 72                           | 91  | 1·8069           | 4·56420          |
| 22                           | 40 | 8649·9           | 93098·3          | 73                           | 91  | 1·6300           | 4·07869          | 22                           | 41 | 8260·8           | 88285·2          | 73                           | 92  | 1·1362           | 2·75730          |
| 23                           | 41 | 7918·6           | 84448·4          | 74                           | 92  | 1·0188           | 2·44869          | 23                           | 42 | 7559·8           | 80024·4          | 74                           | 93  | ·69360           | 1·62110          |
| 24                           | 42 | 7244·4           | 76529·8          | 75                           | 93  | ·61803           | 1·42989          | 24                           | 43 | 6913·8           | 72464·6          | 75                           | 94  | ·41133           | ·92750           |
| 25                           | 43 | 6623·1           | 69285·4          | 76                           | 94  | ·36384           | ·81186           | 25                           | 44 | 6318·3           | 65550·8          | 76                           | 95  | ·23663           | ·51617           |
| 26                           | 44 | 6050·9           | 62662·3          | 77                           | 95  | ·20767           | ·44802           | 26                           | 45 | 5770·0           | 59232·5          | 77                           | 96  | ·13203           | ·27954           |
| 27                           | 45 | 5524·5           | 56611·4          | 78                           | 96  | ·11482           | ·24035           | 27                           | 46 | 5265·6           | 53462·5          | 78                           | 97  | ·07147           | ·14751           |
| 28                           | 46 | 5040·6           | 51086·9          | 79                           | 97  | ·06155           | ·12553           | 28                           | 47 | 4802·0           | 48196·9          | 79                           | 98  | ·03756           | ·07604           |
| 29                           | 47 | 4596·0           | 46046·3          | 80                           | 98  | ·03198           | ·06398           | 29                           | 48 | 4376·2           | 43394·9          | 80                           | 99  | ·01946           | ·03848           |
| 30                           | 48 | 4187·9           | 41450·3          | 81                           | 99  | ·01638           | ·03200           | 30                           | 49 | 3985·4           | 39018·7          | 81                           | 100 | ·00990           | ·01902           |
| 31                           | 49 | 3813·4           | 37262·4          | 82                           | 100 | ·00823           | ·01562           | 31                           | 50 | 3626·8           | 35033·3          | 82                           | 101 | ·00478           | ·00912           |
| 32                           | 50 | 3469·8           | 33449·0          | 83                           | 101 | ·00392           | ·00739           | 32                           | 51 | 3297·9           | 31406·5          | 83                           | 102 | ·00235           | ·00434           |
| 33                           | 51 | 3158·7           | 29979·2          | 84                           | 102 | ·00190           | ·00347           | 33                           | 52 | 2996·1           | 28108·6          | 84                           | 103 | ·00113           | ·00199           |
| 34                           | 52 | 2865·6           | 26820·5          | 85                           | 103 | ·00090           | ·00157           | 34                           | 53 | 2719·3           | 25112·5          | 85                           | 104 | ·00055           | ·00086           |
| 35                           | 53 | 2600·5           | 23954·9          | 86                           | 104 | ·00043           | ·00067           | 35                           | 54 | 2465·3           | 22393·3          | 86                           | 105 | ·00025           | ·00031           |
| 36                           | 54 | 2357·2           | 21354·4          | 87                           | 105 | ·00019           | ·00024           | 36                           | 55 | 2232·4           | 19927·9          | 87                           | 106 | ·00006           | ·00006           |
| 37                           | 55 | 2134·1           | 18997·2          | 88                           | 106 | ·00005           | ·00005           | 37                           | 56 | 2018·9           | 17695·5          | DIFFERENCE OF AGE, 77 YEARS. |     |                  |                  |
| 38                           | 56 | 1929·6           | 16863·1          | DIFFERENCE OF AGE, 78 YEARS. |     |                  |                  | 38                           | 57 | 1823·2           | 15676·6          |                              |     |                  |                  |
| 39                           | 57 | 1742·2           | 14933·5          |                              |     |                  |                  | 39                           | 58 | 1643·9           | 13853·4          | 10                           | 87  | 159·31           | 526·481          |
| 40                           | 58 | 1570·4           | 13191·3          | 10                           | 88  | 120·49           | 382·444          | 40                           | 59 | 1479·8           | 12209·5          | 11                           | 88  | 115·56           | 367·171          |
| 41                           | 59 | 1413·2           | 11620·9          | 11                           | 89  | 85·916           | 261·954          | 41                           | 60 | 1329·6           | 10729·7          | 12                           | 89  | 82·474           | 251·611          |
| 42                           | 60 | 1269·3           | 10207·7          | 12                           | 90  | 60·040           | 176·038          | 42                           | 61 | 1192·2           | 9400·12          | 13                           | 90  | 57·676           | 169·137          |
| 43                           | 61 | 1137·8           | 8938·36          | 13                           | 91  | 41·100           | 115·998          | 43                           | 62 | 1066·5           | 8207·92          | 14                           | 91  | 39·499           | 111·461          |
| 44                           | 62 | 1017·4           | 7800·56          | 14                           | 92  | 27·533           | 74·8984          | 44                           | 63 | 951·68           | 7141·42          | 15                           | 92  | 26·466           | 71·9623          |
| 45                           | 63 | 907·50           | 6783·16          | 15                           | 93  | 18·017           | 47·3654          | 45                           | 64 | 846·84           | 6189·74          | 16                           | 93  | 17·317           | 45·4963          |
| 46                           | 64 | 807·15           | 5875·66          | 16                           | 94  | 11·525           | 29·3484          | 46                           | 65 | 751·28           | 5342·90          | 17                           | 94  | 11·073           | 28·1793          |
| 47                           | 65 | 715·73           | 5068·51          | 17                           | 95  | 7·2012           | 17·8234          | 47                           | 66 | 664·27           | 4591·62          | 18                           | 95  | 6·9153           | 17·1063          |
| 48                           | 66 | 632·50           | 4352·78          | 18                           | 96  | 4·3966           | 10·6222          | 48                           | 67 | 585·26           | 3927·35          | 19                           | 96  | 4·2202           | 10·1910          |
| 49                           | 67 | 556·97           | 3720·28          | 19                           | 97  | 2·6268           | 6·22560          | 49                           | 68 | 513·62           | 3342·09          | 20                           | 97  | 2·5204           | 5·97079          |
| 50                           | 68 | 488·49           | 3163·31          | 20                           | 98  | 1·5380           | 3·59880          | 50                           | 69 | 448·88           | 2828·47          | 21                           | 98  | 1·4751           | 3·45039          |
| 51                           | 69 | 426·64           | 2674·82          | 21                           | 99  | ·89730           | 2·06080          | 51                           | 70 | 390·47           | 2379·59          | 22                           | 99  | ·86038           | 1·97529          |
| 52                           | 70 | 370·83           | 2248·18          | 22                           | 100 | ·51985           | 1·16350          | 52                           | 71 | 337·94           | 1989·12          | 23                           | 100 | ·49831           | 1·11491          |
| 53                           | 71 | 320·67           | 1877·35          | 23                           | 101 | ·28904           | ·64365           | 53                           | 72 | 290·80           | 1651·18          | 24                           | 101 | ·27698           | ·61660           |
| 54                           | 72 | 275·69           | 1556·68          | 24                           | 102 | ·16576           | ·35461           | 54                           | 73 | 248·69           | 1360·38          | 25                           | 102 | ·15879           | ·33962           |
| 55                           | 73 | 235·53           | 1280·99          | 25                           | 103 | ·09447           | ·18885           | 55                           | 74 | 211·20           | 1111·69          | 26                           | 103 | ·09047           | ·18083           |
| 56                           | 74 | 199·79           | 1045·46          | 26                           | 104 | ·05466           | ·09438           | 56                           | 75 | 178·02           | 900·491          | 27                           | 104 | ·05234           | ·09036           |
| 57                           | 75 | 168·21           | 845·670          | 27                           | 105 | ·03036           | ·03972           | 57                           | 76 | 148·79           | 722·471          | 28                           | 105 | ·02906           | ·03802           |
| 58                           | 76 | 140·40           | 677·460          | 28                           | 106 | ·00936           | ·00936           | 58                           | 77 | 123·22           | 573·681          | 29                           | 106 | ·00896           | ·00896           |
| 59                           | 77 | 116·10           | 537·060          |                              |     |                  |                  | 59                           | 78 | 100·97           | 450·461          |                              |     |                  |                  |
| 60                           | 78 | 94·996           | 420·960          |                              |     |                  |                  | 60                           | 79 | 81·805           | 349·491          |                              |     |                  |                  |

78 YEARS.

77 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 20 YEARS. |    |                   |                   |                              |     |                   |                   | DIFFERENCE OF AGE, 21 YEARS. |    |                   |                   |                              |     |                   |                   |
|------------------------------|----|-------------------|-------------------|------------------------------|-----|-------------------|-------------------|------------------------------|----|-------------------|-------------------|------------------------------|-----|-------------------|-------------------|
| Ages.                        |    | D <sub>x, y</sub> | N <sub>x, y</sub> | Ages.                        |     | D <sub>x, y</sub> | N <sub>x, y</sub> | Ages.                        |    | D <sub>x, y</sub> | N <sub>x, y</sub> | Ages.                        |     | D <sub>x, y</sub> | N <sub>x, y</sub> |
| x.                           | y. |                   |                   | x.                           | y.  |                   |                   | x.                           | y. |                   |                   | x.                           | y.  |                   |                   |
| 10                           | 30 | 22067             | 256748            | 61                           | 81  | 55·106            | 217·224           | 10                           | 31 | 21115             | 244710            | 61                           | 82  | 45·830            | 174·058           |
| 11                           | 31 | 20251             | 234681            | 62                           | 82  | 42·959            | 162·118           | 11                           | 32 | 19375             | 223595            | 62                           | 83  | 35·276            | 128·228           |
| 12                           | 32 | 18599             | 214430            | 63                           | 83  | 32·997            | 119·159           | 12                           | 33 | 17792             | 204220            | 63                           | 84  | 26·731            | 92·9521           |
| 13                           | 33 | 17091             | 195831            | 64                           | 84  | 24·945            | 86·1618           | 13                           | 34 | 16347             | 186428            | 64                           | 85  | 19·919            | 66·2211           |
| 14                           | 34 | 15710             | 178740            | 65                           | 85  | 18·540            | 61·2168           | 14                           | 35 | 15024             | 170081            | 65                           | 86  | 14·568            | 46·3021           |
| 15                           | 35 | 14441             | 163030            | 66                           | 86  | 13·521            | 42·6768           | 15                           | 36 | 13808             | 155057            | 66                           | 87  | 10·445            | 31·7341           |
| 16                           | 36 | 13271             | 148589            | 67                           | 87  | 9·6650            | 29·1558           | 16                           | 37 | 12687             | 141249            | 67                           | 88  | 7·3095            | 21·2891           |
| 17                           | 37 | 12188             | 135318            | 68                           | 88  | 6·7407            | 19·4908           | 17                           | 38 | 11649             | 128562            | 68                           | 89  | 5·0116            | 13·9796           |
| 18                           | 38 | 11187             | 123130            | 69                           | 89  | 4·6052            | 12·7501           | 18                           | 39 | 10690             | 116913            | 69                           | 90  | 3·3526            | 8·96799           |
| 19                           | 39 | 10261             | 111943            | 70                           | 90  | 3·0683            | 8·14485           | 19                           | 40 | 9802·2            | 106223            | 70                           | 91  | 2·1865            | 5·61539           |
| 20                           | 40 | 9405·2            | 101682            | 71                           | 91  | 1·9925            | 5·07655           | 20                           | 41 | 8982·2            | 96420·8           | 71                           | 92  | 1·3889            | 3·42889           |
| 21                           | 41 | 8615·3            | 92276·5           | 72                           | 92  | 1·2595            | 3·08405           | 21                           | 42 | 8225·0            | 87438·6           | 72                           | 93  | ·85746            | 2·03999           |
| 22                           | 42 | 7886·6            | 83661·2           | 73                           | 93  | ·77350            | 1·82455           | 22                           | 43 | 7526·7            | 79213·6           | 73                           | 94  | ·51481            | 1·18253           |
| 23                           | 43 | 7214·9            | 75774·6           | 74                           | 94  | ·46163            | 1·05105           | 23                           | 44 | 6882·9            | 71686·9           | 74                           | 95  | ·30022            | ·66772            |
| 24                           | 44 | 6595·6            | 68559·7           | 75                           | 95  | ·26751            | ·58942            | 24                           | 45 | 6289·4            | 64804·0           | 75                           | 96  | ·17008            | ·36750            |
| 25                           | 45 | 6025·0            | 61964·1           | 76                           | 96  | ·15044            | ·32191            | 25                           | 46 | 5741·6            | 58514·6           | 76                           | 97  | ·09364            | ·19742            |
| 26                           | 46 | 5499·6            | 55939·1           | 77                           | 97  | ·08218            | ·17147            | 26                           | 47 | 5239·4            | 52773·0           | 77                           | 98  | ·05015            | ·10378            |
| 27                           | 47 | 5016·5            | 50439·5           | 78                           | 98  | ·04361            | ·08929            | 27                           | 48 | 4776·6            | 47533·6           | 78                           | 99  | ·02653            | ·05363            |
| 28                           | 48 | 4572·4            | 45423·0           | 79                           | 99  | ·02284            | ·04568            | 28                           | 49 | 4351·4            | 42757·0           | 79                           | 100 | ·01380            | ·02710            |
| 29                           | 49 | 4164·6            | 40850·6           | 80                           | 100 | ·01176            | ·02284            | 29                           | 50 | 3960·8            | 38405·6           | 80                           | 101 | ·00682            | ·01330            |
| 30                           | 50 | 3790·4            | 36686·0           | 81                           | 101 | ·00574            | ·01108            | 30                           | 51 | 3602·6            | 34444·8           | 81                           | 102 | ·00344            | ·00648            |
| 31                           | 51 | 3447·1            | 32895·6           | 82                           | 102 | ·00286            | ·00534            | 31                           | 52 | 3273·7            | 30842·2           | 82                           | 103 | ·00170            | ·00304            |
| 32                           | 52 | 3132·0            | 29448·5           | 83                           | 103 | ·00140            | ·00248            | 32                           | 53 | 2972·0            | 27568·5           | 83                           | 104 | ·00084            | ·00134            |
| 33                           | 53 | 2843·1            | 26316·5           | 84                           | 104 | ·00068            | ·00108            | 33                           | 54 | 2695·3            | 24596·5           | 84                           | 105 | ·00040            | ·00050            |
| 34                           | 54 | 2578·0            | 23473·4           | 85                           | 105 | ·00032            | ·00040            | 34                           | 55 | 2441·5            | 21901·2           | 85                           | 106 | ·00010            | ·00010            |
| 35                           | 55 | 2334·8            | 20895·4           | 86                           | 106 | ·00008            | ·00008            | 35                           | 56 | 2208·7            | 19459·7           | DIFFERENCE OF AGE, 75 YEARS. |     |                   |                   |
| 36                           | 56 | 2111·9            | 18560·6           | DIFFERENCE OF AGE, 76 YEARS. |     |                   |                   | 36                           | 57 | 1995·5            | 17251·0           |                              |     |                   |                   |
| 37                           | 57 | 1907·6            | 16448·7           |                              |     |                   |                   | 37                           | 58 | 1800·0            | 15255·5           | 10                           | 85  | 262·45            | 945·753           |
| 38                           | 58 | 1720·4            | 14541·1           | 10                           | 86  | 206·23            | 711·732           | 38                           | 59 | 1621·1            | 13455·5           | 11                           | 86  | 197·79            | 683·303           |
| 39                           | 59 | 1549·1            | 12820·7           | 11                           | 87  | 152·80            | 505·502           | 39                           | 60 | 1457·4            | 11834·4           | 12                           | 87  | 146·68            | 485·513           |
| 40                           | 60 | 1392·2            | 11271·6           | 12                           | 88  | 110·93            | 352·702           | 40                           | 61 | 1307·5            | 10377·0           | 13                           | 88  | 106·56            | 338·833           |
| 41                           | 61 | 1248·7            | 9879·36           | 13                           | 89  | 79·227            | 241·772           | 41                           | 62 | 1170·5            | 9069·50           | 14                           | 89  | 76·141            | 232·273           |
| 42                           | 62 | 1117·5            | 8630·66           | 14                           | 90  | 55·430            | 162·545           | 42                           | 63 | 1045·3            | 7899·00           | 15                           | 90  | 53·280            | 156·132           |
| 43                           | 63 | 997·59            | 7513·16           | 16                           | 91  | 37·967            | 107·115           | 43                           | 64 | 930·91            | 6853·70           | 16                           | 91  | 36·491            | 102·852           |
| 44                           | 64 | 888·07            | 6515·57           | 16                           | 92  | 25·436            | 69·1478           | 44                           | 65 | 826·60            | 5922·79           | 17                           | 92  | 24·438            | 66·3609           |
| 45                           | 65 | 788·22            | 5627·50           | 17                           | 93  | 16·637            | 43·7118           | 45                           | 66 | 731·55            | 5096·19           | 18                           | 93  | 15·976            | 41·9229           |
| 46                           | 66 | 697·26            | 4839·28           | 18                           | 94  | 10·663            | 27·0748           | 46                           | 67 | 645·18            | 4364·64           | 19                           | 94  | 10·207            | 25·9469           |
| 47                           | 67 | 614·66            | 4142·02           | 19                           | 95  | 6·6379            | 16·4118           | 47                           | 68 | 566·82            | 3719·46           | 20                           | 95  | 6·3690            | 15·7399           |
| 48                           | 68 | 539·72            | 3527·36           | 20                           | 96  | 4·0493            | 9·77388           | 48                           | 69 | 495·95            | 3152·64           | 21                           | 96  | 3·8839            | 9·37087           |
| 49                           | 69 | 471·97            | 2987·64           | 21                           | 97  | 2·4174            | 5·72458           | 49                           | 70 | 431·96            | 2656·69           | 22                           | 97  | 2·3180            | 5·48697           |
| 50                           | 70 | 410·82            | 2515·67           | 22                           | 98  | 1·4144            | 3·30718           | 50                           | 71 | 374·38            | 2224·73           | 23                           | 98  | 1·3558            | 3·16897           |
| 51                           | 71 | 355·83            | 2104·85           | 23                           | 99  | ·82474            | 1·89278           | 51                           | 72 | 322·68            | 1850·35           | 24                           | 99  | ·79032            | 1·81317           |
| 52                           | 72 | 306·45            | 1749·02           | 24                           | 100 | ·47752            | 1·06804           | 52                           | 73 | 276·44            | 1527·67           | 25                           | 100 | ·45744            | 1·02285           |
| 53                           | 73 | 262·32            | 1442·57           | 25                           | 101 | ·26534            | ·59052            | 53                           | 74 | 235·23            | 1251·23           | 26                           | 101 | ·25411            | ·56541            |
| 54                           | 74 | 223·00            | 1180·25           | 26                           | 102 | ·15207            | ·32518            | 54                           | 75 | 198·71            | 1016·00           | 27                           | 102 | ·14560            | ·31130            |
| 55                           | 75 | 188·19            | 957·251           | 27                           | 103 | ·08662            | ·17311            | 55                           | 76 | 166·46            | 817·288           | 28                           | 103 | ·08292            | ·16570            |
| 56                           | 76 | 157·47            | 769·061           | 28                           | 104 | ·05010            | ·08649            | 56                           | 77 | 138·20            | 650·828           | 29                           | 104 | ·04795            | ·08278            |
| 57                           | 77 | 130·58            | 611·591           | 29                           | 105 | ·02781            | ·03639            | 57                           | 78 | 113·56            | 512·628           | 30                           | 105 | ·02662            | ·03483            |
| 58                           | 78 | 107·16            | 481·011           | 30                           | 106 | ·00858            | ·00858            | 58                           | 79 | 92·278            | 399·068           | 31                           | 106 | ·00821            | ·00821            |
| 59                           | 79 | 86·953            | 373·851           |                              |     |                   |                   | 59                           | 80 | 74·059            | 306·790           |                              |     |                   |                   |
| 60                           | 80 | 69·674            | 286·898           |                              |     |                   |                   | 60                           | 81 | 58·673            | 232·731           |                              |     |                   |                   |

76 YEARS.

75 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 22 YEARS. |    |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 23 YEARS. |    |                  |                  |                              |     |                  |                  |
|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                           | y. |                  |                  | x.                           | y.  |                  |                  | x.                           | y. |                  |                  | x.                           | y.  |                  |                  |
| 10                           | 32 | 20201            | 233146           | 61                           | 83  | 37·634           | 137·627          | 10                           | 33 | 19324            | 222033           | 61                           | 84  | 30·488           | 107·284          |
| 11                           | 33 | 18534            | 212945           | 62                           | 84  | 28·578           | 99·9927          | 11                           | 34 | 17727            | 202709           | 62                           | 85  | 22·820           | 76·7962          |
| 12                           | 34 | 17017            | 194411           | 63                           | 85  | 21·346           | 71·4147          | 12                           | 35 | 16274            | 184982           | 63                           | 86  | 16·773           | 53·9762          |
| 13                           | 35 | 15633            | 177394           | 64                           | 86  | 15·652           | 50·0687          | 13                           | 36 | 14947            | 168708           | 64                           | 87  | 12·091           | 37·2032          |
| 14                           | 36 | 14365            | 161761           | 65                           | 87  | 11·254           | 34·4167          | 14                           | 37 | 13732            | 153761           | 65                           | 88  | 8·5116           | 25·1122          |
| 15                           | 37 | 13200            | 147396           | 66                           | 88  | 7·8995           | 23·1627          | 15                           | 38 | 12616            | 140029           | 66                           | 89  | 5·8732           | 16·6006          |
| 16                           | 38 | 12126            | 134196           | 67                           | 89  | 5·4345           | 15·2632          | 16                           | 39 | 11587            | 127413           | 67                           | 90  | 3·9563           | 10·7274          |
| 17                           | 39 | 11132            | 122070           | 68                           | 90  | 3·6484           | 9·82874          | 17                           | 40 | 10634            | 115826           | 68                           | 91  | 2·5998           | 6·77114          |
| 18                           | 40 | 10212            | 110938           | 69                           | 91  | 2·3890           | 6·18034          | 18                           | 41 | 9752·5           | 105192           | 69                           | 92  | 1·6653           | 4·17134          |
| 19                           | 41 | 9361·3           | 100726           | 70                           | 92  | 1·5241           | 3·79134          | 19                           | 42 | 8937·3           | 95439·3          | 70                           | 93  | 1·0376           | 2·50604          |
| 20                           | 42 | 8575·3           | 91364·4          | 71                           | 93  | ·94556           | 2·26724          | 20                           | 43 | 8184·0           | 86502·0          | 71                           | 94  | ·62932           | 1·46844          |
| 21                           | 43 | 7849·7           | 82789·1          | 72                           | 94  | ·57069           | 1·32168          | 21                           | 44 | 7488·5           | 78318·0          | 72                           | 95  | ·37115           | ·83912           |
| 22                           | 44 | 7180·3           | 74939·4          | 73                           | 95  | ·33481           | ·75099           | 22                           | 45 | 6847·0           | 70829·5          | 73                           | 96  | ·21286           | ·46797           |
| 23                           | 45 | 6563·3           | 67759·1          | 74                           | 96  | ·19087           | ·41618           | 23                           | 46 | 6255·7           | 63982·5          | 74                           | 97  | ·11880           | ·25511           |
| 24                           | 46 | 5994·7           | 61195·8          | 75                           | 97  | ·10586           | ·22531           | 24                           | 47 | 5711·0           | 57726·8          | 75                           | 98  | ·06460           | ·13631           |
| 25                           | 47 | 5470·9           | 55201·1          | 76                           | 98  | ·05714           | ·11945           | 25                           | 48 | 5209·3           | 52015·8          | 76                           | 99  | ·03476           | ·07171           |
| 26                           | 48 | 4988·8           | 49730·2          | 77                           | 99  | ·03050           | ·06231           | 26                           | 49 | 4747·6           | 46806·5          | 77                           | 100 | ·01843           | ·03695           |
| 27                           | 49 | 4545·7           | 44741·4          | 78                           | 100 | ·01603           | ·03181           | 27                           | 50 | 4323·2           | 42058·9          | 78                           | 101 | ·00930           | ·01852           |
| 28                           | 50 | 4138·4           | 40195·7          | 79                           | 101 | ·00801           | ·01578           | 28                           | 51 | 3933·4           | 37735·7          | 79                           | 102 | ·00479           | ·00922           |
| 29                           | 51 | 3764·6           | 36057·3          | 80                           | 102 | ·00408           | ·00777           | 29                           | 52 | 3575·2           | 33802·3          | 80                           | 103 | ·00243           | ·00443           |
| 30                           | 52 | 3421·4           | 32292·7          | 81                           | 103 | ·00204           | ·00369           | 30                           | 53 | 3246·6           | 30227·1          | 81                           | 104 | ·00124           | ·00200           |
| 31                           | 53 | 3106·5           | 28871·3          | 82                           | 104 | ·00103           | ·00165           | 31                           | 54 | 2945·1           | 26980·5          | 82                           | 105 | ·00060           | ·00076           |
| 32                           | 54 | 2817·6           | 25764·8          | 83                           | 105 | ·00049           | ·00062           | 32                           | 55 | 2668·4           | 24035·4          | 83                           | 106 | ·00016           | ·00016           |
| 33                           | 55 | 2552·6           | 22947·2          | 84                           | 106 | ·00013           | ·00013           | 33                           | 56 | 2414·7           | 21367·0          | DIFFERENCE OF AGE, 73 YEARS. |     |                  |                  |
| 34                           | 56 | 2309·6           | 20394·6          | DIFFERENCE OF AGE, 74 YEARS. |     |                  |                  | 34                           | 57 | 2182·3           | 18952·3          |                              |     |                  |                  |
| 35                           | 57 | 2087·0           | 18085·0          |                              |     |                  |                  | 35                           | 58 | 1969·3           | 16770·0          |                              |     |                  |                  |
| 36                           | 58 | 1882·9           | 15998·0          |                              |     |                  |                  | 36                           | 59 | 1774·2           | 14800·7          |                              |     |                  |                  |
| 37                           | 59 | 1696·1           | 14115·1          | 10                           | 84  | 328·67           | 1236·92          | 37                           | 60 | 1595·7           | 13026·5          | 10                           | 83  | 405·71           | 1593·11          |
| 38                           | 60 | 1525·1           | 12419·0          | 11                           | 85  | 251·72           | 908·248          | 38                           | 61 | 1432·4           | 11430·8          | 11                           | 84  | 315·22           | 1187·40          |
| 39                           | 61 | 1368·8           | 10893·9          | 12                           | 86  | 189·87           | 656·528          | 39                           | 62 | 1283·0           | 9998·45          | 12                           | 85  | 241·63           | 872·183          |
| 40                           | 62 | 1225·6           | 9525·14          | 13                           | 87  | 140·90           | 466·658          | 40                           | 63 | 1146·5           | 8715·45          | 13                           | 86  | 182·39           | 630·553          |
| 41                           | 63 | 1094·9           | 8299·54          | 14                           | 88  | 102·41           | 325·758          | 41                           | 64 | 1021·7           | 7568·95          | 14                           | 87  | 135·41           | 448·163          |
| 42                           | 64 | 975·42           | 7204·64          | 15                           | 89  | 73·198           | 223·348          | 42                           | 65 | 907·90           | 6547·25          | 15                           | 88  | 98·439           | 312·753          |
| 43                           | 65 | 866·47           | 6229·22          | 16                           | 90  | 51·209           | 150·150          | 43                           | 66 | 804·17           | 5639·35          | 16                           | 89  | 70·343           | 214·314          |
| 44                           | 66 | 767·16           | 5362·75          | 17                           | 91  | 35·058           | 98·9410          | 44                           | 67 | 709·86           | 4835·18          | 17                           | 90  | 49·198           | 143·971          |
| 45                           | 67 | 676·91           | 4595·59          | 18                           | 92  | 23·468           | 63·8830          | 45                           | 68 | 624·23           | 4125·32          | 18                           | 91  | 33·666           | 94·7728          |
| 46                           | 68 | 594·98           | 3918·68          | 19                           | 93  | 15·335           | 40·4150          | 46                           | 69 | 546·73           | 3501·09          | 19                           | 92  | 22·526           | 61·1068          |
| 47                           | 69 | 520·86           | 3323·70          | 20                           | 94  | 9·7933           | 25·0800          | 47                           | 70 | 476·70           | 2954·36          | 20                           | 93  | 14·714           | 38·5808          |
| 48                           | 70 | 453·91           | 2802·84          | 21                           | 95  | 6·1089           | 15·2867          | 48                           | 71 | 413·64           | 2477·66          | 21                           | 94  | 9·3932           | 23·8668          |
| 49                           | 71 | 393·64           | 2348·93          | 22                           | 96  | 3·7241           | 9·17775          | 49                           | 72 | 356·97           | 2064·02          | 22                           | 95  | 5·8575           | 14·4736          |
| 50                           | 72 | 339·50           | 1955·29          | 23                           | 97  | 2·2219           | 5·45365          | 50                           | 73 | 306·26           | 1707·05          | 23                           | 96  | 3·5698           | 8·61613          |
| 51                           | 73 | 291·08           | 1615·79          | 24                           | 98  | 1·2993           | 3·23175          | 51                           | 74 | 261·01           | 1400·79          | 24                           | 97  | 2·1292           | 5·04633          |
| 52                           | 74 | 247·89           | 1324·71          | 25                           | 99  | ·95312           | 1·93245          | 52                           | 75 | 220·88           | 1139·78          | 25                           | 98  | 1·2446           | 2·91713          |
| 53                           | 75 | 209·60           | 1076·82          | 26                           | 100 | ·43808           | ·97933           | 53                           | 76 | 185·40           | 918·899          | 26                           | 99  | ·72505           | 1·67253          |
| 54                           | 76 | 175·76           | 867·219          | 27                           | 101 | ·24330           | ·54125           | 54                           | 77 | 154·25           | 733·499          | 27                           | 100 | ·41945           | ·94748           |
| 55                           | 77 | 146·09           | 691·459          | 28                           | 102 | ·13938           | ·29795           | 55                           | 78 | 127·05           | 579·249          | 28                           | 101 | ·23290           | ·52803           |
| 56                           | 78 | 120·19           | 545·369          | 29                           | 103 | ·07936           | ·15857           | 56                           | 79 | 103·50           | 452·199          | 29                           | 102 | ·13340           | ·29513           |
| 57                           | 79 | 97·795           | 425·179          | 30                           | 104 | ·04589           | ·07921           | 57                           | 80 | 83·292           | 348·699          | 30                           | 103 | ·07594           | ·16173           |
| 58                           | 80 | 78·594           | 327·384          | 31                           | 105 | ·02547           | ·03332           | 58                           | 81 | 66·185           | 265·407          | 31                           | 104 | ·04391           | ·08579           |
| 59                           | 81 | 62·366           | 248·790          | 32                           | 106 | ·00785           | ·00785           | 59                           | 82 | 51·868           | 199·222          | 32                           | 105 | ·03437           | ·04188           |
| 60                           | 82 | 48·797           | 186·424          |                              |     |                  |                  | 60                           | 83 | 40·070           | 147·354          | 33                           | 106 | ·00751           | ·00751           |

74 YEARS.

7 D

73 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 24 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 25 YEARS. |       |           |           |                              |       |           |           |
|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                           | 34    | 18483     | 211256    | 61                           | 85    | 24·345    | 82·3690   | 10                           | 35    | 17675     | 201098    | 61                           | 86    | 19·130    | 62·2171   |
| 11                           | 35    | 16952     | 192773    | 62                           | 86    | 17·931    | 58·0240   | 11                           | 36    | 16209     | 183423    | 62                           | 87    | 13·852    | 43·0871   |
| 12                           | 36    | 15560     | 175821    | 63                           | 87    | 12·957    | 40·0930   | 12                           | 37    | 14875     | 167214    | 63                           | 88    | 9·7995    | 29·2351   |
| 13                           | 37    | 14289     | 160231    | 64                           | 88    | 9·1445    | 27·1360   | 13                           | 38    | 13657     | 152339    | 64                           | 89    | 6·7988    | 19·4356   |
| 14                           | 38    | 13125     | 145972    | 65                           | 89    | 6·3282    | 17·9915   | 14                           | 39    | 12542     | 138682    | 65                           | 90    | 4·6069    | 12·6368   |
| 15                           | 39    | 12055     | 132847    | 66                           | 90    | 4·2756    | 11·6633   | 15                           | 40    | 11516     | 126140    | 66                           | 91    | 3·0468    | 8·02993   |
| 16                           | 40    | 11069     | 120792    | 67                           | 91    | 2·8192    | 7·38769   | 16                           | 41    | 10571     | 114624    | 67                           | 92    | 1·9652    | 4·98313   |
| 17                           | 41    | 10155     | 109723    | 68                           | 92    | 1·8122    | 4·56849   | 17                           | 42    | 9695·6    | 104053    | 68                           | 93    | 1·2338    | 3·01793   |
| 18                           | 42    | 9310·8    | 99567·8   | 69                           | 93    | 1·1337    | 2·75629   | 18                           | 43    | 8885·9    | 94357·3   | 69                           | 94    | ·75455    | 1·78413   |
| 19                           | 43    | 8529·4    | 90257·0   | 70                           | 94    | ·69058    | 1·62259   | 19                           | 44    | 8137·0    | 85471·4   | 70                           | 95    | ·44912    | 1·02958   |
| 20                           | 44    | 7807·4    | 81727·6   | 71                           | 95    | ·40928    | ·93201    | 20                           | 45    | 7444·9    | 77334·4   | 71                           | 96    | ·26021    | ·58046    |
| 21                           | 45    | 7140·8    | 73920·2   | 72                           | 96    | ·23597    | ·52273    | 21                           | 46    | 6806·2    | 69889·5   | 72                           | 97    | ·14687    | ·32025    |
| 22                           | 46    | 6526·1    | 66779·4   | 73                           | 97    | ·13249    | ·28676    | 22                           | 47    | 6217·3    | 63083·3   | 73                           | 98    | ·08085    | ·17338    |
| 23                           | 47    | 5959·7    | 60253·3   | 74                           | 98    | ·07250    | ·15427    | 23                           | 48    | 5674·7    | 56866·0   | 74                           | 99    | ·04410    | ·09253    |
| 24                           | 48    | 5437·9    | 54293·6   | 75                           | 99    | ·03929    | ·08177    | 24                           | 49    | 5175·0    | 51191·3   | 75                           | 100   | ·02374    | ·04843    |
| 25                           | 49    | 4957·4    | 48855·7   | 76                           | 100   | ·02100    | ·04248    | 25                           | 50    | 4714·9    | 46016·3   | 76                           | 101   | ·01218    | ·02469    |
| 26                           | 50    | 4515·3    | 43898·3   | 77                           | 101   | ·01069    | ·02148    | 26                           | 51    | 4291·6    | 41301·4   | 77                           | 102   | ·00640    | ·01251    |
| 27                           | 51    | 4109·0    | 39383·0   | 78                           | 102   | ·00556    | ·01079    | 27                           | 52    | 3902·4    | 37009·8   | 78                           | 103   | ·00331    | ·00611    |
| 28                           | 52    | 3735·6    | 35274·0   | 79                           | 103   | ·00285    | ·00523    | 28                           | 53    | 3544·7    | 33107·4   | 79                           | 104   | ·00172    | ·00280    |
| 29                           | 53    | 3392·6    | 31538·4   | 80                           | 104   | ·00147    | ·00238    | 29                           | 54    | 3216·3    | 29562·7   | 80                           | 105   | ·00085    | ·00108    |
| 30                           | 54    | 3077·9    | 28145·8   | 81                           | 105   | ·00072    | ·00091    | 30                           | 55    | 2914·9    | 26346·4   | 81                           | 106   | ·00023    | ·00023    |
| 31                           | 55    | 2689·1    | 25067·9   | 82                           | 106   | ·00019    | ·00019    | 31                           | 56    | 2638·5    | 23431·5   | DIFFERENCE OF AGE, 71 YEARS. |       |           |           |
| 32                           | 56    | 2524·3    | 22378·8   | DIFFERENCE OF AGE, 72 YEARS. |       |           |           | 32                           | 57    | 2385·2    | 20793·0   |                              |       |           |           |
| 33                           | 57    | 2281·7    | 19854·5   |                              |       |           |           | 33                           | 58    | 2153·0    | 1840·78   | 10                           | 81    | 594·06    | 2537·11   |
| 34                           | 58    | 2059·2    | 17572·8   | 10                           | 82    | 494·07    | 2023·69   | 34                           | 59    | 1940·4    | 16254·8   | 11                           | 82    | 473·86    | 1943·05   |
| 35                           | 59    | 1855·6    | 15513·6   | 11                           | 83    | 389·11    | 1529·62   | 35                           | 60    | 1745·8    | 14314·4   | 12                           | 83    | 373·52    | 1469·19   |
| 36                           | 60    | 1669·2    | 13558·0   | 12                           | 84    | 302·59    | 1140·51   | 36                           | 61    | 1567·7    | 12568·6   | 13                           | 84    | 290·68    | 1095·67   |
| 37                           | 61    | 1498·7    | 11988·8   | 13                           | 85    | 232·12    | 837·916   | 37                           | 62    | 1404·8    | 11000·9   | 14                           | 85    | 223·08    | 804·995   |
| 38                           | 62    | 1342·7    | 10490·1   | 14                           | 86    | 175·29    | 605·796   | 38                           | 63    | 1255·9    | 9596·15   | 15                           | 86    | 168·49    | 581·915   |
| 39                           | 63    | 1200·1    | 9147·37   | 15                           | 87    | 130·16    | 430·506   | 39                           | 64    | 1119·9    | 8340·25   | 16                           | 87    | 125·10    | 413·425   |
| 40                           | 64    | 1069·8    | 7947·27   | 16                           | 88    | 94·612    | 300·346   | 40                           | 65    | 995·77    | 7220·35   | 17                           | 88    | 90·897    | 288·325   |
| 41                           | 65    | 950·98    | 6877·47   | 17                           | 89    | 67·580    | 205·734   | 41                           | 66    | 882·60    | 6224·58   | 18                           | 89    | 64·898    | 197·428   |
| 42                           | 66    | 842·62    | 5926·49   | 18                           | 90    | 47·245    | 138·154   | 42                           | 67    | 779·68    | 5341·98   | 19                           | 90    | 45·350    | 132·530   |
| 43                           | 67    | 744·10    | 5083·87   | 19                           | 91    | 32·316    | 90·9086   | 43                           | 68    | 686·20    | 4562·30   | 20                           | 91    | 31·007    | 87·1799   |
| 44                           | 68    | 654·62    | 4339·77   | 20                           | 92    | 21·614    | 58·5926   | 44                           | 69    | 601·54    | 3876·10   | 21                           | 92    | 20·731    | 56·1729   |
| 45                           | 69    | 573·61    | 3685·15   | 21                           | 93    | 14·113    | 36·9786   | 45                           | 70    | 524·98    | 3274·56   | 22                           | 93    | 13·533    | 35·4419   |
| 46                           | 70    | 500·38    | 3111·54   | 22                           | 94    | 9·0067    | 22·8656   | 46                           | 71    | 455·99    | 2749·58   | 23                           | 94    | 8·6336    | 21·9089   |
| 47                           | 71    | 434·42    | 2611·16   | 23                           | 95    | 5·6149    | 13·8589   | 47                           | 72    | 393·94    | 2293·59   | 24                           | 95    | 5·3805    | 13·2753   |
| 48                           | 72    | 375·11    | 2176·74   | 24                           | 96    | 3·4208    | 8·24395   | 48                           | 73    | 338·38    | 1899·65   | 25                           | 96    | 3·2770    | 7·89484   |
| 49                           | 73    | 322·02    | 1801·63   | 25                           | 97    | 2·0397    | 4·82315   | 49                           | 74    | 288·75    | 1561·27   | 26                           | 97    | 1·9534    | 4·61784   |
| 50                           | 74    | 274·62    | 1479·61   | 26                           | 98    | 1·1920    | 2·78345   | 50                           | 75    | 244·70    | 1272·52   | 27                           | 98    | 1·1413    | 2·66444   |
| 51                           | 75    | 232·58    | 1204·99   | 27                           | 99    | ·69420    | 1·59145   | 51                           | 76    | 205·73    | 1027·82   | 28                           | 99    | ·66453    | 1·52314   |
| 52                           | 76    | 195·38    | 972·409   | 28                           | 100   | ·40152    | ·89725    | 52                           | 77    | 171·47    | 822·085   | 29                           | 100   | ·38429    | ·85861    |
| 53                           | 77    | 162·71    | 777·029   | 29                           | 101   | ·22290    | ·49573    | 53                           | 78    | 141·50    | 650·615   | 30                           | 101   | ·21331    | ·47432    |
| 54                           | 78    | 134·15    | 614·319   | 30                           | 102   | ·12766    | ·27283    | 54                           | 79    | 115·52    | 509·115   | 31                           | 102   | ·12215    | ·26101    |
| 55                           | 79    | 109·41    | 480·169   | 31                           | 103   | ·07267    | ·14517    | 55                           | 80    | 93·184    | 393·595   | 32                           | 103   | ·06952    | ·13886    |
| 56                           | 80    | 88·151    | 370·759   | 32                           | 104   | ·04201    | ·07250    | 56                           | 81    | 74·233    | 300·411   | 33                           | 104   | ·04018    | ·06934    |
| 57                           | 81    | 70·141    | 282·608   | 33                           | 105   | ·02331    | ·03049    | 57                           | 82    | 58·335    | 226·178   | 34                           | 105   | ·02229    | ·02916    |
| 58                           | 82    | 55·045    | 212·467   | 34                           | 106   | ·00718    | ·00718    | 58                           | 83    | 45·200    | 167·843   | 35                           | 106   | ·00687    | ·00687    |
| 59                           | 83    | 42·592    | 157·422   |                              |       |           |           | 59                           | 84    | 34·504    | 122·643   |                              |       |           |           |
| 60                           | 84    | 32·461    | 114·830   |                              |       |           |           | 60                           | 85    | 25·922    | 88·1391   |                              |       |           |           |

72 YEARS.

71 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 26 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 27 YEARS. |       |           |           |                              |       |           |           |
|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                           | 36    | 16900     | 191238    | 61                           | 87    | 14.778    | 46.1868   | 10                           | 37    | 16156     | 181765    | 61                           | 88    | 11.177    | 33.6602   |
| 11                           | 37    | 15495     | 174338    | 62                           | 88    | 10.476    | 31.4088   | 11                           | 38    | 14810     | 165609    | 62                           | 89    | 7.7890    | 22.4832   |
| 12                           | 38    | 14217     | 158843    | 63                           | 89    | 7.2858    | 20.9328   | 12                           | 39    | 13585     | 150799    | 63                           | 90    | 5.3040    | 14.6942   |
| 13                           | 39    | 13050     | 144626    | 64                           | 90    | 4.9495    | 13.6470   | 13                           | 40    | 12467     | 137214    | 64                           | 91    | 3.5270    | 9.39023   |
| 14                           | 40    | 11981     | 131576    | 65                           | 91    | 3.2829    | 8.69752   | 14                           | 41    | 11442     | 124747    | 65                           | 92    | 2.2883    | 5.86323   |
| 15                           | 41    | 10998     | 119595    | 66                           | 92    | 2.1238    | 5.41462   | 15                           | 42    | 10500     | 113305    | 66                           | 93    | 1.4459    | 3.57493   |
| 16                           | 42    | 10092     | 108597    | 67                           | 93    | 1.3379    | 3.29082   | 16                           | 43    | 9631.5    | 102805    | 67                           | 94    | .89042    | 2.12903   |
| 17                           | 43    | 9253.2    | 98505.3   | 68                           | 94    | .82113    | 1.95292   | 17                           | 44    | 8827.4    | 93173.8   | 68                           | 95    | .53402    | 1.23861   |
| 18                           | 44    | 8477.0    | 89252.1   | 69                           | 95    | .49072    | 1.13179   | 18                           | 45    | 8083.4    | 84346.4   | 69                           | 96    | .31199    | .70459    |
| 19                           | 45    | 7759.2    | 80775.1   | 70                           | 96    | .28554    | .64107    | 19                           | 46    | 7395.5    | 76263.0   | 70                           | 97    | .17773    | .39260    |
| 20                           | 46    | 7096.0    | 73015.9   | 71                           | 97    | .16196    | .35553    | 20                           | 47    | 6760.2    | 68867.5   | 71                           | 98    | .09883    | .21487    |
| 21                           | 47    | 6484.1    | 65919.9   | 72                           | 98    | .08962    | .19357    | 21                           | 48    | 6174.0    | 62107.3   | 72                           | 99    | .05452    | .11604    |
| 22                           | 48    | 5920.0    | 59435.8   | 73                           | 99    | .04918    | .10395    | 22                           | 49    | 5633.8    | 55933.3   | 73                           | 100   | .02971    | .06152    |
| 23                           | 49    | 5400.4    | 53515.8   | 74                           | 100   | .02664    | .05477    | 23                           | 50    | 5136.1    | 50299.5   | 74                           | 101   | .01545    | .03181    |
| 24                           | 50    | 4921.8    | 48115.4   | 75                           | 101   | .01377    | .02813    | 24                           | 51    | 4677.9    | 45163.4   | 75                           | 102   | .00824    | .01636    |
| 25                           | 51    | 4481.2    | 43193.6   | 76                           | 102   | .00729    | .01436    | 25                           | 52    | 4255.9    | 40485.5   | 76                           | 103   | .00434    | .00812    |
| 26                           | 52    | 4075.8    | 38712.4   | 77                           | 103   | .00381    | .00707    | 26                           | 53    | 3867.6    | 36229.6   | 77                           | 104   | .00230    | .00378    |
| 27                           | 53    | 3703.0    | 34636.6   | 78                           | 104   | .00200    | .00326    | 27                           | 54    | 3510.6    | 32362.0   | 78                           | 105   | .00116    | .00148    |
| 28                           | 54    | 3360.5    | 30933.6   | 79                           | 105   | .00099    | .00126    | 28                           | 55    | 3182.6    | 28851.4   | 79                           | 106   | .00032    | .00032    |
| 29                           | 55    | 3046.0    | 27573.1   | 80                           | 106   | .00027    | .00027    | 29                           | 56    | 2881.5    | 25668.8   | DIFFERENCE OF AGE, 69 YEARS. |       |           |           |
| 30                           | 56    | 2757.5    | 24527.1   | DIFFERENCE OF AGE, 70 YEARS. |       |           |           | 30                           | 57    | 2605.5    | 22787.3   |                              |       |           |           |
| 31                           | 57    | 2493.1    | 21769.6   |                              |       |           |           | 31                           | 58    | 2352.5    | 20181.8   |                              |       |           |           |
| 32                           | 58    | 2250.6    | 19276.5   |                              |       |           |           | 32                           | 59    | 2120.8    | 17829.3   |                              |       |           |           |
| 33                           | 59    | 2028.7    | 17025.9   | 10                           | 80    | 705.44    | 3141.50   | 33                           | 60    | 1908.6    | 15708.5   | 10                           | 79    | 828.27    | 3844.58   |
| 34                           | 60    | 1825.5    | 14997.2   | 11                           | 81    | 569.76    | 2436.06   | 34                           | 61    | 1714.5    | 13799.9   | 11                           | 80    | 676.58    | 3016.31   |
| 35                           | 61    | 1639.6    | 13171.7   | 12                           | 82    | 454.87    | 1866.30   | 35                           | 62    | 1537.9    | 12085.4   | 12                           | 81    | 546.93    | 2339.73   |
| 36                           | 62    | 1469.5    | 11532.1   | 13                           | 83    | 358.82    | 1411.43   | 36                           | 63    | 1374.6    | 10547.5   | 13                           | 82    | 436.96    | 1792.80   |
| 37                           | 63    | 1314.0    | 10062.6   | 14                           | 84    | 279.36    | 1052.61   | 37                           | 64    | 1226.2    | 9172.88   | 14                           | 83    | 344.84    | 1355.84   |
| 38                           | 64    | 1172.0    | 8748.57   | 15                           | 85    | 214.43    | 773.249   | 38                           | 65    | 1090.9    | 7946.68   | 15                           | 84    | 268.52    | 1011.00   |
| 39                           | 65    | 1042.4    | 7576.57   | 16                           | 86    | 161.94    | 558.819   | 39                           | 66    | 967.42    | 6855.78   | 16                           | 85    | 206.09    | 742.481   |
| 40                           | 66    | 9241.7    | 6534.17   | 17                           | 87    | 120.19    | 396.879   | 40                           | 67    | 855.14    | 5888.36   | 17                           | 86    | 155.58    | 536.391   |
| 41                           | 67    | 816.68    | 5610.00   | 18                           | 88    | 87.288    | 276.689   | 41                           | 68    | 753.13    | 5033.22   | 18                           | 87    | 115.42    | 380.811   |
| 42                           | 68    | 719.01    | 4793.32   | 19                           | 89    | 62.294    | 189.401   | 42                           | 69    | 660.71    | 4280.09   | 19                           | 88    | 83.786    | 265.391   |
| 43                           | 69    | 630.56    | 4074.31   | 20                           | 90    | 43.513    | 127.107   | 43                           | 70    | 577.10    | 3619.38   | 20                           | 89    | 59.771    | 181.605   |
| 44                           | 70    | 550.54    | 3443.75   | 21                           | 91    | 29.741    | 83.5945   | 44                           | 71    | 501.71    | 3042.28   | 21                           | 90    | 41.735    | 121.834   |
| 45                           | 71    | 478.41    | 2893.21   | 22                           | 92    | 19.878    | 53.8535   | 45                           | 72    | 433.84    | 2540.57   | 22                           | 91    | 28.517    | 80.0990   |
| 46                           | 72    | 413.51    | 2414.80   | 23                           | 93    | 12.972    | 33.9755   | 46                           | 73    | 373.02    | 2106.73   | 23                           | 92    | 19.054    | 51.5820   |
| 47                           | 73    | 355.37    | 2001.29   | 24                           | 94    | 8.2733    | 21.0035   | 47                           | 74    | 318.66    | 1733.71   | 24                           | 93    | 12.431    | 32.5280   |
| 48                           | 74    | 303.42    | 1645.92   | 25                           | 95    | 5.1543    | 12.7302   | 48                           | 75    | 270.36    | 1415.05   | 25                           | 94    | 7.9255    | 20.0970   |
| 49                           | 75    | 257.29    | 1342.50   | 26                           | 96    | 3.1383    | 7.57586   | 49                           | 76    | 227.59    | 1144.69   | 26                           | 95    | 4.9362    | 12.1715   |
| 50                           | 76    | 216.45    | 1085.21   | 27                           | 97    | 1.8703    | 4.43756   | 50                           | 77    | 189.96    | 917.099   | 27                           | 96    | 3.0048    | 7.23530   |
| 51                           | 77    | 180.55    | 868.759   | 28                           | 98    | 1.0925    | 2.56726   | 51                           | 78    | 157.02    | 727.139   | 28                           | 97    | 1.7903    | 4.23050   |
| 52                           | 78    | 149.12    | 688.209   | 29                           | 99    | .63601    | 1.47476   | 52                           | 79    | 128.42    | 570.119   | 29                           | 98    | 1.0456    | 2.44020   |
| 53                           | 79    | 121.86    | 539.089   | 30                           | 100   | .36775    | .83875    | 53                           | 80    | 103.79    | 441.699   | 30                           | 99    | .60864    | 1.39460   |
| 54                           | 80    | 98.393    | 417.229   | 31                           | 101   | .20410    | .47100    | 54                           | 81    | 82.858    | 337.909   | 31                           | 100   | .35188    | .78596    |
| 55                           | 81    | 78.471    | 318.836   | 32                           | 102   | .11686    | .26690    | 55                           | 82    | 65.263    | 255.051   | 32                           | 101   | .19527    | .43408    |
| 56                           | 82    | 61.738    | 240.365   | 33                           | 103   | .08372    | .15004    | 56                           | 83    | 50.697    | 189.788   | 33                           | 102   | .11179    | .23881    |
| 57                           | 83    | 47.902    | 178.627   | 34                           | 104   | .03843    | .06632    | 57                           | 84    | 38.806    | 139.091   | 34                           | 103   | .06361    | .12702    |
| 58                           | 84    | 36.617    | 130.725   | 35                           | 105   | .02132    | .02789    | 58                           | 85    | 29.240    | 100.285   | 35                           | 104   | .03675    | .06341    |
| 59                           | 85    | 27.553    | 94.1078   | 36                           | 106   | .00657    | .00657    | 59                           | 86    | 21.650    | 71.0452   | 36                           | 105   | .02038    | .02666    |
| 60                           | 86    | 20.368    | 66.5548   |                              |       |           |           | 60                           | 87    | 15.735    | 49.3952   | 37                           | 106   | .00628    | .00628    |

70 YEARS.

69 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 28 YEARS. |      |           |           |                              |      |           |           | DIFFERENCE OF AGE, 29 YEARS. |      |           |           |                              |      |           |           |
|------------------------------|------|-----------|-----------|------------------------------|------|-----------|-----------|------------------------------|------|-----------|-----------|------------------------------|------|-----------|-----------|
| Ages.                        |      | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |      | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |      | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |      | $D_{x,y}$ | $N_{x,y}$ |
| $x.$                         | $y.$ |           |           | $x.$                         | $y.$ |           |           | $x.$                         | $y.$ |           |           | $x.$                         | $y.$ |           |           |
| 10                           | 38   | 15442     | 172659    | 61                           | 89   | 8·3096    | 24·0882   | 10                           | 39   | 14756     | 163905    | 61                           | 90   | 6·0493    | 16·9012   |
| 11                           | 39   | 14152     | 157217    | 62                           | 90   | 5·6703    | 15·7786   | 11                           | 40   | 13519     | 149149    | 62                           | 91   | 4·0407    | 10·8519   |
| 12                           | 40   | 12978     | 143065    | 63                           | 91   | 3·7796    | 10·1083   | 12                           | 41   | 12394     | 135630    | 63                           | 92   | 2·6346    | 6·81115   |
| 13                           | 41   | 11906     | 130087    | 64                           | 92   | 2·4585    | 6·32872   | 13                           | 42   | 11367     | 123236    | 64                           | 93   | 1·6737    | 4·17655   |
| 14                           | 42   | 10924     | 118181    | 65                           | 93   | 1·5579    | 3·87022   | 14                           | 43   | 10425     | 111869    | 65                           | 94   | 1·0369    | 2·50285   |
| 15                           | 43   | 10021     | 107257    | 66                           | 94   | ·96230    | 2·31232   | 15                           | 44   | 9559·9    | 101444    | 66                           | 95   | ·62583    | 1·46595   |
| 16                           | 44   | 9188·2    | 97235·7   | 67                           | 95   | ·57909    | 1·35002   | 16                           | 45   | 8761·6    | 91884·0   | 67                           | 96   | ·36817    | ·84012    |
| 17                           | 45   | 8417·5    | 88047·5   | 68                           | 96   | ·33952    | ·77093    | 17                           | 46   | 8023·1    | 83122·4   | 68                           | 97   | ·21133    | ·47195    |
| 18                           | 46   | 7704·6    | 79630·0   | 69                           | 97   | ·19419    | ·43141    | 18                           | 47   | 7340·0    | 75099·3   | 69                           | 98   | ·11850    | ·26062    |
| 19                           | 47   | 7045·6    | 71925·4   | 70                           | 98   | ·10845    | ·23722    | 19                           | 48   | 6708·7    | 67759·3   | 70                           | 99   | ·06597    | ·14212    |
| 20                           | 48   | 6437·0    | 64879·8   | 71                           | 99   | ·06012    | ·12877    | 20                           | 49   | 6125·7    | 61050·6   | 71                           | 100  | ·03632    | ·07615    |
| 21                           | 49   | 5875·5    | 58442·8   | 72                           | 100  | ·03294    | ·06865    | 21                           | 50   | 5588·0    | 54924·9   | 72                           | 101  | ·01911    | ·03983    |
| 22                           | 50   | 5358·1    | 52567·3   | 73                           | 101  | ·01724    | ·03571    | 22                           | 51   | 5092·6    | 49336·9   | 73                           | 102  | ·01031    | ·02072    |
| 23                           | 51   | 4881·6    | 47209·2   | 74                           | 102  | ·00925    | ·01847    | 23                           | 52   | 4636·1    | 44244·3   | 74                           | 103  | ·00550    | ·01041    |
| 24                           | 52   | 4442·6    | 42327·6   | 75                           | 103  | ·00490    | ·00922    | 24                           | 53   | 4215·7    | 39608·2   | 75                           | 104  | ·00296    | ·00491    |
| 25                           | 53   | 4038·5    | 37885·0   | 76                           | 104  | ·00262    | ·00432    | 25                           | 54   | 3828·6    | 35392·5   | 76                           | 105  | ·00152    | ·00195    |
| 26                           | 54   | 3666·6    | 33846·5   | 77                           | 105  | ·00133    | ·00170    | 26                           | 55   | 3472·5    | 31563·9   | 77                           | 106  | ·00043    | ·00043    |
| 27                           | 55   | 3324·7    | 30179·9   | 78                           | 106  | ·00037    | ·00037    | 27                           | 56   | 3145·2    | 28091·4   | DIFFERENCE OF AGE, 67 YEARS. |      |           |           |
| 28                           | 56   | 3010·7    | 26855·2   | DIFFERENCE OF AGE, 68 YEARS. |      |           |           | 28                           | 57   | 2844·8    | 24946·2   |                              |      |           |           |
| 29                           | 57   | 2722·7    | 23844·5   |                              |      |           |           | 29                           | 58   | 2569·1    | 22101·4   | 10                           | 77   | 1105·9    | 5573·76   |
| 30                           | 58   | 2458·6    | 21121·8   | 30                           | 59   | 2316·7    | 19532·3   | 11                           | 78   | 922·47    | 4467·86   |                              |      |           |           |
| 31                           | 59   | 2216·7    | 18663·2   | 31                           | 60   | 2085·5    | 17215·6   | 12                           | 79   | 762·56    | 3545·39   |                              |      |           |           |
| 32                           | 60   | 1995·3    | 16446·5   | 32                           | 61   | 1873·9    | 15130·1   | 13                           | 80   | 623·90    | 2782·83   |                              |      |           |           |
| 33                           | 61   | 1792·6    | 14451·2   | 33                           | 62   | 1680·3    | 13256·2   | 14                           | 81   | 504·93    | 2158·93   |                              |      |           |           |
| 34                           | 62   | 1607·1    | 12658·6   | 34                           | 63   | 1503·3    | 11575·9   | 15                           | 82   | 403·66    | 1654·00   |                              |      |           |           |
| 35                           | 63   | 1437·6    | 11051·5   | 35                           | 64   | 1341·5    | 10072·6   | 16                           | 83   | 318·58    | 1250·34   |                              |      |           |           |
| 36                           | 64   | 1282·7    | 9613·92   | 36                           | 65   | 1193·9    | 8731·15   | 17                           | 84   | 247·95    | 931·759   |                              |      |           |           |
| 37                           | 65   | 1141·3    | 8331·22   | 37                           | 66   | 1059·3    | 7537·25   | 18                           | 85   | 190·14    | 683·809   |                              |      |           |           |
| 38                           | 66   | 1012·4    | 7189·92   | 38                           | 67   | 936·80    | 6477·95   | 19                           | 86   | 143·41    | 493·669   |                              |      |           |           |
| 39                           | 67   | 895·17    | 6177·52   | 39                           | 68   | 825·51    | 5541·15   | 20                           | 87   | 106·30    | 350·259   |                              |      |           |           |
| 40                           | 68   | 788·60    | 5282·35   | 40                           | 69   | 724·65    | 4715·64   | 21                           | 88   | 77·109    | 243·959   |                              |      |           |           |
| 41                           | 69   | 692·06    | 4493·75   | 41                           | 70   | 633·38    | 3990·99   | 22                           | 89   | 54·971    | 166·850   |                              |      |           |           |
| 42                           | 70   | 604·69    | 3801·69   | 42                           | 71   | 551·05    | 3357·61   | 23                           | 90   | 38·360    | 111·879   |                              |      |           |           |
| 43                           | 71   | 525·91    | 3197·00   | 43                           | 72   | 476·91    | 2806·56   | 24                           | 91   | 26·195    | 73·5187   |                              |      |           |           |
| 44                           | 72   | 454·96    | 2671·09   | 44                           | 73   | 410·42    | 2329·65   | 25                           | 92   | 17·492    | 47·3237   |                              |      |           |           |
| 45                           | 73   | 391·36    | 2216·13   | 45                           | 74   | 350·93    | 1919·23   | 26                           | 93   | 11·404    | 29·8317   |                              |      |           |           |
| 46                           | 74   | 334·49    | 1824·77   | 46                           | 75   | 298·04    | 1568·30   | 27                           | 94   | 7·2672    | 18·4277   |                              |      |           |           |
| 47                           | 75   | 283·94    | 1490·28   | 47                           | 76   | 251·16    | 1270·26   | 28                           | 95   | 4·5242    | 11·1605   |                              |      |           |           |
| 48                           | 76   | 239·15    | 1206·34   | 48                           | 77   | 209·88    | 1019·10   | 29                           | 96   | 2·7529    | 6·63625   |                              |      |           |           |
| 49                           | 77   | 199·74    | 967·187   | 49                           | 78   | 173·70    | 809·216   | 30                           | 97   | 1·6397    | 3·88335   |                              |      |           |           |
| 50                           | 78   | 165·21    | 767·447   | 50                           | 79   | 142·27    | 635·516   | 31                           | 98   | ·95741    | 2·24365   |                              |      |           |           |
| 51                           | 79   | 135·22    | 602·237   | 51                           | 80   | 115·16    | 493·246   | 32                           | 99   | ·55717    | 1·28624   |                              |      |           |           |
| 52                           | 80   | 109·37    | 467·017   | 52                           | 81   | 92·104    | 378·086   | 33                           | 100  | ·32204    | ·72907    |                              |      |           |           |
| 53                           | 81   | 87·399    | 357·647   | 53                           | 82   | 72·688    | 285·982   | 34                           | 101  | ·17866    | ·40703    |                              |      |           |           |
| 54                           | 82   | 68·911    | 270·248   | 54                           | 83   | 56·587    | 213·294   | 35                           | 102  | ·11225    | ·22837    |                              |      |           |           |
| 55                           | 83   | 53·591    | 201·337   | 55                           | 84   | 43·414    | 156·707   | 36                           | 103  | ·05816    | ·11612    |                              |      |           |           |
| 56                           | 84   | 41·070    | 147·746   | 56                           | 85   | 32·796    | 113·293   | 37                           | 104  | ·03360    | ·05796    |                              |      |           |           |
| 57                           | 85   | 30·988    | 106·676   | 57                           | 86   | 24·350    | 80·4968   | 38                           | 105  | ·01862    | ·02436    |                              |      |           |           |
| 58                           | 86   | 22·975    | 75·6882   | 58                           | 87   | 17·749    | 56·1468   | 39                           | 106  | ·00574    | ·00574    |                              |      |           |           |
| 59                           | 87   | 16·725    | 52·7132   | 59                           | 88   | 12·649    | 38·3978   |                              |      |           |           |                              |      |           |           |
| 60                           | 88   | 11·900    | 35·9882   | 60                           | 89   | 8·8476    | 25·7488   |                              |      |           |           |                              |      |           |           |

68 YEARS.

67 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 30 YEARS. |    |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 31 YEARS. |    |                  |                  |                              |     |                  |                  |
|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                           | y. |                  |                  | x.                           | y.  |                  |                  | x.                           | y. |                  |                  | x.                           | y.  |                  |                  |
| 10                           | 40 | 14096            | 155491           | 61                           | 91  | 4·3107           | 11·6213          | 10                           | 41 | 13462            | 147404           | 61                           | 92  | 3·0048           | 7·82748          |
| 11                           | 41 | 12911            | 141395           | 62                           | 92  | 2·8166           | 7·31063          | 11                           | 42 | 12326            | 133942           | 62                           | 93  | 1·9175           | 4·82268          |
| 12                           | 42 | 11833            | 128484           | 63                           | 93  | 1·7936           | 4·49403          | 12                           | 43 | 11293            | 121616           | 63                           | 94  | 1·1938           | 2·90518          |
| 13                           | 43 | 10848            | 116651           | 64                           | 94  | 1·1140           | 2·70043          | 13                           | 44 | 10349            | 110323           | 64                           | 95  | ·72446           | 1·71138          |
| 14                           | 44 | 9945·6           | 105803           | 65                           | 95  | ·67432           | 1·58643          | 14                           | 45 | 9483·8           | 99974·3          | 65                           | 96  | ·42872           | ·98692           |
| 15                           | 45 | 9116·1           | 95857·5          | 66                           | 96  | ·39789           | ·91211           | 15                           | 46 | 8688·9           | 90490·5          | 66                           | 97  | ·24766           | ·55820           |
| 16                           | 46 | 8351·1           | 86741·4          | 67                           | 97  | ·22916           | ·51422           | 16                           | 47 | 7955·9           | 81801·6          | 67                           | 98  | ·13983           | ·31054           |
| 17                           | 47 | 7643·4           | 78390·3          | 68                           | 98  | ·12895           | ·28506           | 17                           | 48 | 7277·9           | 73845·7          | 68                           | 99  | ·07844           | ·17071           |
| 18                           | 48 | 6989·1           | 70746·9          | 69                           | 99  | ·07208           | ·15611           | 18                           | 49 | 6651·1           | 66567·8          | 69                           | 100 | ·04355           | ·09227           |
| 19                           | 49 | 6384·3           | 63757·8          | 70                           | 100 | ·03986           | ·08403           | 19                           | 50 | 6071·9           | 59916·7          | 70                           | 101 | ·02312           | ·04872           |
| 20                           | 50 | 5826·0           | 57373·5          | 71                           | 101 | ·02107           | ·04417           | 20                           | 51 | 5537·3           | 53844·8          | 71                           | 102 | ·01261           | ·02560           |
| 21                           | 51 | 5311·1           | 51547·5          | 72                           | 102 | ·01143           | ·02310           | 21                           | 52 | 5044·0           | 48307·5          | 72                           | 103 | ·00680           | ·01299           |
| 22                           | 52 | 4836·5           | 46236·4          | 73                           | 103 | ·00614           | ·01167           | 22                           | 53 | 4589·4           | 43263·5          | 73                           | 104 | ·00371           | ·00619           |
| 23                           | 53 | 4399·3           | 41399·9          | 74                           | 104 | ·00332           | ·00553           | 23                           | 54 | 4170·7           | 38674·1          | 74                           | 105 | ·00193           | ·00248           |
| 24                           | 54 | 3996·6           | 37000·6          | 75                           | 105 | ·00172           | ·00221           | 24                           | 55 | 3785·0           | 34503·4          | 75                           | 106 | ·00055           | ·00055           |
| 25                           | 55 | 3625·9           | 33004·0          | 76                           | 106 | ·00049           | ·00049           | 25                           | 56 | 3430·1           | 30718·4          | DIFFERENCE OF AGE, 65 YEARS. |     |                  |                  |
| 26                           | 56 | 3284·9           | 29378·1          | DIFFERENCE OF AGE, 66 YEARS. |     |                  |                  | 26                           | 57 | 3103·9           | 27288·3          |                              |     |                  |                  |
| 27                           | 57 | 2971·8           | 26093·2          |                              |     |                  |                  | 27                           | 58 | 2804·2           | 24184·4          | 10                           | 75  | 1424·7           | 7770·01          |
| 28                           | 58 | 2684·3           | 23121·4          | 10                           | 76  | 1260·2           | 6611·90          | 28                           | 59 | 2529·4           | 21380·2          | 11                           | 76  | 1205·6           | 6345·31          |
| 29                           | 59 | 2420·9           | 20437·1          | 11                           | 77  | 1060·7           | 5351·70          | 29                           | 60 | 2277·5           | 18850·8          | 12                           | 77  | 1018·2           | 5139·71          |
| 30                           | 60 | 2179·5           | 18016·2          | 12                           | 78  | 885·52           | 4291·00          | 30                           | 61 | 2047·0           | 16573·3          | 13                           | 78  | 850·65           | 4121·51          |
| 31                           | 61 | 1958·7           | 15836·7          | 13                           | 79  | 732·53           | 3405·48          | 31                           | 62 | 1837·0           | 14526·3          | 14                           | 79  | 704·00           | 3270·86          |
| 32                           | 62 | 1756·5           | 13878·0          | 14                           | 80  | 599·60           | 2672·95          | 32                           | 63 | 1643·0           | 12689·3          | 15                           | 80  | 576·35           | 2566·86          |
| 33                           | 63 | 1571·7           | 12121·5          | 15                           | 81  | 485·35           | 2073·35          | 33                           | 64 | 1466·7           | 11046·3          | 16                           | 81  | 466·48           | 1990·51          |
| 34                           | 64 | 1402·8           | 10549·8          | 16                           | 82  | 387·97           | 1588·00          | 34                           | 65 | 1305·7           | 9579·59          | 17                           | 82  | 372·73           | 1524·03          |
| 35                           | 65 | 1248·7           | 9146·96          | 17                           | 83  | 306·07           | 1200·03          | 35                           | 66 | 1158·9           | 8273·89          | 18                           | 83  | 293·92           | 1151·30          |
| 36                           | 66 | 1108·0           | 7898·26          | 18                           | 84  | 238·11           | 893·959          | 36                           | 67 | 1025·3           | 7114·99          | 19                           | 84  | 228·55           | 857·381          |
| 37                           | 67 | 980·15           | 6790·26          | 19                           | 85  | 182·51           | 655·849          | 37                           | 68 | 903·87           | 6089·69          | 20                           | 85  | 175·12           | 628·831          |
| 38                           | 68 | 863·90           | 5810·11          | 20                           | 86  | 137·60           | 473·339          | 38                           | 69 | 793·85           | 5185·82          | 21                           | 86  | 131·98           | 453·711          |
| 39                           | 69 | 758·57           | 4946·21          | 21                           | 87  | 101·96           | 335·739          | 39                           | 70 | 694·26           | 4391·97          | 22                           | 87  | 97·762           | 321·731          |
| 40                           | 70 | 663·21           | 4187·64          | 22                           | 88  | 73·937           | 233·779          | 40                           | 71 | 604·38           | 3697·71          | 23                           | 88  | 70·873           | 223·969          |
| 41                           | 71 | 577·20           | 3524·43          | 23                           | 89  | 52·693           | 159·842          | 41                           | 72 | 523·42           | 3093·33          | 24                           | 89  | 50·494           | 153·096          |
| 42                           | 72 | 499·71           | 2947·23          | 24                           | 90  | 36·759           | 107·149          | 42                           | 73 | 450·78           | 2569·91          | 25                           | 90  | 35·214           | 102·602          |
| 43                           | 73 | 430·21           | 2447·52          | 25                           | 91  | 25·093           | 70·3896          | 43                           | 74 | 385·77           | 2119·13          | 26                           | 91  | 24·031           | 67·3880          |
| 44                           | 74 | 368·02           | 2017·31          | 26                           | 92  | 16·751           | 45·2966          | 44                           | 75 | 327·92           | 1733·36          | 27                           | 92  | 16·039           | 43·3570          |
| 45                           | 75 | 312·70           | 1649·29          | 27                           | 93  | 10·919           | 28·5456          | 45                           | 76 | 276·60           | 1405·44          | 28                           | 93  | 10·452           | 27·3180          |
| 46                           | 76 | 263·63           | 1336·59          | 28                           | 94  | 6·9565           | 17·6266          | 46                           | 77 | 231·37           | 1128·84          | 29                           | 94  | 6·6580           | 16·8660          |
| 47                           | 77 | 220·42           | 1072·96          | 29                           | 95  | 4·3300           | 10·6701          | 47                           | 78 | 191·70           | 897·467          | 30                           | 95  | 4·1437           | 10·2080          |
| 48                           | 78 | 182·53           | 852·541          | 30                           | 96  | 2·6345           | 6·34009          | 48                           | 79 | 157·19           | 705·767          | 31                           | 96  | 2·5208           | 6·06432          |
| 49                           | 79 | 149·59           | 670·011          | 31                           | 97  | 1·5690           | 3·70559          | 49                           | 80 | 127·40           | 548·577          | 32                           | 97  | 1·5011           | 3·54352          |
| 50                           | 80 | 121·17           | 520·421          | 32                           | 98  | ·91597           | 2·13659          | 50                           | 81 | 102·04           | 421·177          | 33                           | 98  | ·87621           | 2·04242          |
| 51                           | 81 | 96·981           | 399·251          | 33                           | 99  | ·53299           | 1·22062          | 51                           | 82 | 80·657           | 319·137          | 34                           | 99  | ·50978           | 1·16621          |
| 52                           | 82 | 76·601           | 302·270          | 34                           | 100 | ·30801           | ·68763           | 52                           | 83 | 62·901           | 238·480          | 35                           | 100 | ·29456           | ·65643           |
| 53                           | 83 | 59·689           | 225·669          | 35                           | 101 | ·17086           | ·37962           | 53                           | 84 | 48·354           | 175·579          | 36                           | 101 | ·16336           | ·36187           |
| 54                           | 84 | 45·841           | 165·980          | 36                           | 102 | ·09777           | ·20876           | 54                           | 85 | 36·606           | 127·225          | 37                           | 102 | ·09246           | ·19851           |
| 55                           | 85 | 34·668           | 120·139          | 37                           | 103 | ·05560           | ·11099           | 55                           | 86 | 27·241           | 90·6189          | 38                           | 103 | ·05314           | ·10605           |
| 56                           | 86 | 25·770           | 85·4705          | 38                           | 104 | ·03211           | ·05539           | 56                           | 87 | 19·908           | 63·3779          | 39                           | 104 | ·03068           | ·05291           |
| 57                           | 87 | 18·810           | 59·7005          | 39                           | 105 | ·01780           | ·02328           | 57                           | 88 | 14·226           | 43·4699          | 40                           | 105 | ·01700           | ·02223           |
| 58                           | 88 | 13·424           | 40·8905          | 40                           | 106 | ·00548           | ·00548           | 58                           | 89 | 9·9803           | 29·2439          | 41                           | 106 | ·00523           | ·00523           |
| 59                           | 89 | 9·4043           | 27·4665          |                              |     |                  |                  | 59                           | 90 | 6·8463           | 19·2636          |                              |     |                  |                  |
| 60                           | 90 | 6·4409           | 18·0622          |                              |     |                  |                  | 60                           | 91 | 4·5898           | 12·4173          |                              |     |                  |                  |

66 YEARS.

7 E

65 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 32 YEARS. |    |           |           |                              |     |           |           | DIFFERENCE OF AGE, 33 YEARS. |    |           |           |                              |     |           |           |
|------------------------------|----|-----------|-----------|------------------------------|-----|-----------|-----------|------------------------------|----|-----------|-----------|------------------------------|-----|-----------|-----------|
| Ages.                        |    | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |     | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |    | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |     | $D_{x,y}$ | $N_{x,y}$ |
| x.                           | y. |           |           | x.                           | y.  |           |           | x.                           | y. |           |           | x.                           | y.  |           |           |
| 10                           | 42 | 12852     | 139629    | 61                           | 93  | 2·0457    | 5·16274   | 10                           | 43 | 12265     | 132157    | 61                           | 94  | 1·3615    | 3·33634   |
| 11                           | 43 | 11764     | 126777    | 62                           | 94  | 1·2762    | 3·11704   | 11                           | 44 | 11222     | 119892    | 62                           | 95  | ·82998    | 1·97484   |
| 12                           | 44 | 10773     | 115013    | 63                           | 95  | ·77636    | 1·84084   | 12                           | 45 | 10273     | 108670    | 63                           | 96  | ·49359    | 1·14486   |
| 13                           | 45 | 9868·2    | 104240    | 64                           | 96  | ·46060    | 1·06448   | 13                           | 46 | 9405·7    | 98396·6   | 64                           | 97  | ·28669    | ·65127    |
| 14                           | 46 | 9039·4    | 94372·0   | 65                           | 97  | ·26684    | ·60388    | 14                           | 47 | 8611·6    | 88990·9   | 65                           | 98  | ·16283    | ·36458    |
| 15                           | 47 | 8277·7    | 85332·6   | 66                           | 98  | ·15112    | ·33704    | 15                           | 48 | 7881·9    | 80379·3   | 66                           | 99  | ·09192    | ·20175    |
| 16                           | 48 | 7575·5    | 77054·9   | 67                           | 99  | ·08506    | ·18592    | 16                           | 49 | 7209·2    | 72497·4   | 67                           | 100 | ·05139    | ·10983    |
| 17                           | 49 | 6926·1    | 69479·4   | 68                           | 100 | ·04739    | ·10086    | 17                           | 50 | 6587·2    | 65288·2   | 68                           | 101 | ·02749    | ·05844    |
| 18                           | 50 | 6325·7    | 62553·3   | 69                           | 101 | ·02526    | ·05347    | 18                           | 51 | 6012·2    | 58701·0   | 69                           | 102 | ·01512    | ·03095    |
| 19                           | 51 | 5771·0    | 56227·6   | 70                           | 102 | ·01383    | ·02821    | 19                           | 52 | 5480·8    | 52688·8   | 70                           | 103 | ·00823    | ·01583    |
| 20                           | 52 | 5258·8    | 50456·6   | 71                           | 103 | ·00750    | ·01438    | 20                           | 53 | 4990·2    | 47208·0   | 71                           | 104 | ·00453    | ·00760    |
| 21                           | 53 | 4786·4    | 45197·8   | 72                           | 104 | ·00411    | ·00688    | 21                           | 54 | 4537·7    | 42217·8   | 72                           | 105 | ·00238    | ·00307    |
| 22                           | 54 | 4351·0    | 40411·4   | 73                           | 105 | ·00215    | ·00277    | 22                           | 55 | 4120·6    | 37680·1   | 73                           | 106 | ·00069    | ·00069    |
| 23                           | 55 | 3949·9    | 36060·4   | 74                           | 106 | ·00062    | ·00062    | 23                           | 56 | 3736·6    | 33559·5   | DIFFERENCE OF AGE, 63 YEARS. |     |           |           |
| 24                           | 56 | 3580·6    | 32110·5   | DIFFERENCE OF AGE, 64 YEARS. |     |           |           | 24                           | 57 | 3383·3    | 29822·9   |                              |     |           |           |
| 25                           | 57 | 3241·0    | 28529·9   |                              |     |           |           | 25                           | 58 | 3058·2    | 26439·6   |                              |     |           |           |
| 26                           | 58 | 2928·8    | 25288·9   |                              |     |           |           | 26                           | 59 | 2759·8    | 23381·4   |                              |     |           |           |
| 27                           | 59 | 2642·4    | 22360·1   | 10                           | 74  | 1598·8    | 9061·95   | 27                           | 60 | 2485·9    | 20621·6   | 10                           | 73  | 1783·0    | 10483·4   |
| 28                           | 60 | 2379·7    | 19717·7   | 11                           | 75  | 1366·4    | 7463·15   | 28                           | 61 | 2235·0    | 18135·7   | 11                           | 74  | 1533·4    | 8700·36   |
| 29                           | 61 | 2139·1    | 17338·0   | 12                           | 76  | 1160·2    | 6096·75   | 29                           | 62 | 2005·1    | 15900·7   | 12                           | 75  | 1311·6    | 7166·96   |
| 30                           | 62 | 1918·8    | 15198·9   | 13                           | 77  | 978·12    | 4936·55   | 30                           | 63 | 1794·8    | 13895·6   | 13                           | 76  | 1114·5    | 5855·36   |
| 31                           | 63 | 1717·3    | 13280·1   | 14                           | 78  | 817·52    | 3958·43   | 31                           | 64 | 1602·6    | 12100·8   | 14                           | 77  | 940·02    | 4740·86   |
| 32                           | 64 | 1533·2    | 11562·8   | 15                           | 79  | 676·70    | 3140·91   | 32                           | 65 | 1427·1    | 10498·2   | 15                           | 78  | 785·81    | 3800·84   |
| 33                           | 65 | 1365·1    | 10029·6   | 16                           | 80  | 553·95    | 2464·21   | 33                           | 66 | 1267·0    | 9071·05   | 16                           | 79  | 650·29    | 3015·03   |
| 34                           | 66 | 1211·8    | 8664·50   | 17                           | 81  | 448·16    | 1910·26   | 34                           | 67 | 1121·3    | 7804·05   | 17                           | 80  | 532·19    | 2364·74   |
| 35                           | 67 | 1072·3    | 7452·70   | 18                           | 82  | 357·93    | 1462·10   | 35                           | 68 | 988·86    | 6682·75   | 18                           | 81  | 430·37    | 1832·55   |
| 36                           | 68 | 945·50    | 6380·40   | 19                           | 83  | 282·13    | 1104·17   | 36                           | 69 | 868·83    | 5693·89   | 19                           | 82  | 343·57    | 1402·18   |
| 37                           | 69 | 830·58    | 5434·90   | 20                           | 84  | 219·30    | 822·036   | 37                           | 70 | 760·16    | 4825·06   | 20                           | 83  | 270·70    | 1058·61   |
| 38                           | 70 | 726·55    | 4604·32   | 21                           | 85  | 167·96    | 602·736   | 38                           | 71 | 662·10    | 4064·90   | 21                           | 84  | 210·34    | 787·905   |
| 39                           | 71 | 632·67    | 3877·77   | 22                           | 86  | 126·55    | 434·777   | 39                           | 72 | 573·73    | 3402·80   | 22                           | 85  | 161·05    | 577·565   |
| 40                           | 72 | 548·08    | 3245·10   | 23                           | 87  | 93·712    | 308·227   | 40                           | 73 | 494·41    | 2829·07   | 23                           | 86  | 121·31    | 416·515   |
| 41                           | 73 | 472·17    | 2697·02   | 24                           | 88  | 67·916    | 214·515   | 41                           | 74 | 423·40    | 2334·66   | 24                           | 87  | 89·801    | 295·205   |
| 42                           | 74 | 404·22    | 2224·85   | 25                           | 89  | 48·371    | 146·599   | 42                           | 75 | 360·18    | 1911·26   | 25                           | 88  | 65·060    | 205·404   |
| 43                           | 75 | 343·74    | 1820·63   | 26                           | 90  | 33·724    | 98·2278   | 43                           | 76 | 304·06    | 1551·08   | 26                           | 89  | 46·324    | 140·344   |
| 44                           | 76 | 290·06    | 1476·89   | 27                           | 91  | 23·009    | 64·5038   | 44                           | 77 | 254·57    | 1247·02   | 27                           | 90  | 32·289    | 94·0204   |
| 45                           | 77 | 242·75    | 1186·83   | 28                           | 92  | 15·353    | 41·4948   | 45                           | 78 | 211·11    | 992·454   | 28                           | 91  | 22·026    | 61·7314   |
| 46                           | 78 | 201·22    | 944·083   | 29                           | 93  | 10·004    | 26·1418   | 46                           | 79 | 173·28    | 781·344   | 29                           | 92  | 14·694    | 39·7054   |
| 47                           | 79 | 165·08    | 742·863   | 30                           | 94  | 6·3714    | 16·1378   | 47                           | 80 | 140·60    | 608·064   | 30                           | 93  | 9·5731    | 25·0114   |
| 48                           | 80 | 133·88    | 577·783   | 31                           | 95  | 3·9648    | 9·76644   | 48                           | 81 | 112·74    | 467·464   | 31                           | 94  | 6·0965    | 15·4383   |
| 49                           | 81 | 107·29    | 443·903   | 32                           | 96  | 2·4117    | 5·80164   | 49                           | 82 | 89·229    | 354·724   | 32                           | 95  | 3·7932    | 9·34181   |
| 50                           | 82 | 84·863    | 336·613   | 33                           | 97  | 1·4359    | 3·38994   | 50                           | 83 | 69·686    | 265·495   | 33                           | 96  | 2·3070    | 5·54861   |
| 51                           | 83 | 66·233    | 251·750   | 34                           | 98  | ·83806    | 1·95404   | 51                           | 84 | 53·655    | 195·809   | 34                           | 97  | 1·3734    | 3·24161   |
| 52                           | 84 | 50·957    | 185·517   | 35                           | 99  | ·48751    | 1·11598   | 52                           | 85 | 40·691    | 142·154   | 35                           | 98  | ·80145    | 1·86821   |
| 53                           | 85 | 38·613    | 134·560   | 36                           | 100 | ·28164    | ·62847    | 53                           | 86 | 30·341    | 101·463   | 36                           | 99  | ·46613    | 1·06676   |
| 54                           | 86 | 28·764    | 95·9473   | 37                           | 101 | ·15617    | ·34683    | 54                           | 87 | 22·221    | 71·1224   | 37                           | 100 | ·26924    | ·60063    |
| 55                           | 87 | 21·044    | 67·1833   | 38                           | 102 | ·08933    | ·19066    | 55                           | 88 | 15·915    | 48·9014   | 38                           | 101 | ·14926    | ·33139    |
| 56                           | 88 | 15·056    | 46·1393   | 39                           | 103 | ·05078    | ·10133    | 56                           | 89 | 11·194    | 32·9864   | 39                           | 102 | ·08536    | ·18213    |
| 57                           | 89 | 10·577    | 31·0833   | 40                           | 104 | ·02931    | ·05055    | 57                           | 90 | 7·6999    | 21·7924   | 40                           | 103 | ·04851    | ·09677    |
| 58                           | 90 | 7·2656    | 20·5063   | 41                           | 105 | ·01624    | ·02124    | 58                           | 91 | 5·1774    | 14·0925   | 41                           | 104 | ·02799    | ·04826    |
| 59                           | 91 | 4·8786    | 13·2407   | 42                           | 106 | ·00500    | ·00500    | 59                           | 92 | 3·4007    | 8·91514   | 42                           | 105 | ·01550    | ·02027    |
| 60                           | 92 | 3·1994    | 8·36214   |                              |     |           |           | 60                           | 93 | 2·1781    | 5·51444   | 43                           | 106 | ·00477    | ·00477    |

64 YEARS.

63 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 34 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 35 YEARS. |       |           |           |                              |       |           |           |
|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                           | 44    | 11701     | 124877    | 61                           | 95    | 88545     | 211350    | 10                           | 45    | 11158     | 118077    | 61                           | 96    | 56295     | 131414    |
| 11                           | 45    | 10701     | 113176    | 62                           | 96    | 52768     | 122805    | 11                           | 46    | 10200     | 106919    | 62                           | 97    | 32844     | 75119     |
| 12                           | 46    | 9791.4    | 102475    | 63                           | 97    | 30722     | 70037     | 12                           | 47    | 9328.1    | 96718.9   | 63                           | 98    | 18747     | 42275     |
| 13                           | 47    | 8960.7    | 92683.5   | 64                           | 98    | 17494     | 39315     | 13                           | 48    | 8532.2    | 87390.8   | 64                           | 99    | 10641     | 23528     |
| 14                           | 48    | 8199.9    | 83722.8   | 65                           | 99    | 9905      | 21821     | 14                           | 49    | 7803.4    | 78858.6   | 65                           | 100   | 5985      | 12887     |
| 15                           | 49    | 7500.8    | 75522.9   | 66                           | 100   | 5554      | 11916     | 15                           | 50    | 7133.8    | 71055.2   | 66                           | 101   | 3222      | 6902      |
| 16                           | 50    | 6856.4    | 68022.1   | 67                           | 101   | 2981      | 6362      | 16                           | 51    | 6516.7    | 63921.4   | 67                           | 102   | 1784      | 3680      |
| 17                           | 51    | 6260.7    | 61165.7   | 68                           | 102   | 1645      | 3381      | 17                           | 52    | 5945.9    | 57404.7   | 68                           | 103   | 979       | 1896      |
| 18                           | 52    | 5709.9    | 54905.0   | 69                           | 103   | 899       | 1736      | 18                           | 53    | 5418.2    | 51458.8   | 69                           | 104   | 543       | 9917      |
| 19                           | 53    | 5200.9    | 49195.1   | 70                           | 104   | 497       | 837       | 19                           | 54    | 4930.6    | 46040.6   | 70                           | 105   | 289       | 374       |
| 20                           | 54    | 4730.9    | 43994.2   | 71                           | 105   | 263       | 340       | 20                           | 55    | 4480.4    | 41110.0   | 71                           | 106   | 85        | 85        |
| 21                           | 55    | 4297.4    | 39263.3   | 72                           | 106   | 77        | 77        | 21                           | 56    | 4065.3    | 36629.6   | DIFFERENCE OF AGE, 61 YEARS. |       |           |           |
| 22                           | 56    | 3898.1    | 34965.9   | DIFFERENCE OF AGE, 62 YEARS. |       |           |           | 22                           | 57    | 3683.2    | 32564.3   |                              |       |           |           |
| 23                           | 57    | 3530.6    | 31067.8   |                              |       |           |           | 23                           | 58    | 3331.5    | 28881.1   | 10                           | 71    | 2179.6    | 13748.5   |
| 24                           | 58    | 3192.4    | 27537.2   | 10                           | 72    | 1976.6    | 12041.9   | 24                           | 59    | 3008.2    | 25549.6   | 11                           | 72    | 1895.7    | 11568.9   |
| 25                           | 59    | 2881.7    | 24344.8   | 11                           | 73    | 1710.1    | 10065.3   | 25                           | 60    | 2711.1    | 22541.4   | 12                           | 73    | 1641.6    | 9673.17   |
| 26                           | 60    | 2596.4    | 21463.1   | 12                           | 74    | 1472.0    | 8355.24   | 26                           | 61    | 2438.5    | 19830.3   | 13                           | 74    | 1414.0    | 8031.57   |
| 27                           | 61    | 2334.8    | 18866.7   | 13                           | 75    | 1260.0    | 6883.24   | 27                           | 62    | 2188.5    | 17391.8   | 14                           | 75    | 1210.9    | 6617.57   |
| 28                           | 62    | 2095.0    | 16531.9   | 14                           | 76    | 1071.1    | 5623.24   | 28                           | 63    | 1959.6    | 15203.3   | 15                           | 76    | 1029.6    | 5406.67   |
| 29                           | 63    | 1875.5    | 14436.9   | 15                           | 77    | 903.57    | 4552.14   | 29                           | 64    | 1750.2    | 13243.7   | 16                           | 77    | 868.44    | 4377.07   |
| 30                           | 64    | 1674.8    | 12561.4   | 16                           | 78    | 755.26    | 3648.57   | 30                           | 65    | 1558.9    | 11493.5   | 17                           | 78    | 725.60    | 3508.63   |
| 31                           | 65    | 1491.6    | 10886.6   | 17                           | 79    | 624.85    | 2893.31   | 31                           | 66    | 1384.4    | 9934.58   | 18                           | 79    | 600.05    | 2783.03   |
| 32                           | 66    | 1325.4    | 9394.98   | 18                           | 80    | 511.07    | 2268.46   | 32                           | 67    | 1225.5    | 8550.18   | 19                           | 80    | 490.56    | 2182.98   |
| 33                           | 67    | 1172.3    | 8069.58   | 19                           | 81    | 413.11    | 1757.39   | 33                           | 68    | 1081.1    | 7324.68   | 20                           | 81    | 396.38    | 1692.42   |
| 34                           | 68    | 1034.0    | 6897.28   | 20                           | 82    | 329.66    | 1344.28   | 34                           | 69    | 950.19    | 6243.56   | 21                           | 82    | 316.19    | 1296.04   |
| 35                           | 69    | 908.68    | 5863.28   | 21                           | 83    | 259.64    | 1014.62   | 35                           | 70    | 831.64    | 5293.37   | 22                           | 83    | 248.96    | 979.845   |
| 36                           | 70    | 795.17    | 4954.60   | 22                           | 84    | 201.69    | 754.985   | 36                           | 71    | 724.64    | 4461.73   | 23                           | 84    | 193.33    | 730.885   |
| 37                           | 71    | 692.73    | 4159.43   | 23                           | 85    | 154.38    | 553.295   | 37                           | 72    | 628.19    | 3737.09   | 24                           | 85    | 147.94    | 537.555   |
| 38                           | 72    | 600.42    | 3466.70   | 24                           | 86    | 116.25    | 398.915   | 38                           | 73    | 541.63    | 3108.90   | 25                           | 86    | 111.36    | 389.615   |
| 39                           | 73    | 517.55    | 2866.28   | 25                           | 87    | 86.026    | 282.665   | 39                           | 74    | 464.09    | 2567.27   | 26                           | 87    | 82.385    | 278.255   |
| 40                           | 74    | 443.34    | 2348.73   | 26                           | 88    | 62.307    | 196.639   | 40                           | 75    | 395.04    | 2103.18   | 27                           | 88    | 59.656    | 195.870   |
| 41                           | 75    | 277.27    | 1905.39   | 27                           | 89    | 44.354    | 134.332   | 41                           | 76    | 333.71    | 1708.14   | 28                           | 89    | 42.458    | 136.214   |
| 42                           | 76    | 318.59    | 1628.12   | 28                           | 90    | 30.909    | 89.9779   | 42                           | 77    | 279.60    | 1374.43   | 29                           | 90    | 37.242    | 93.7562   |
| 43                           | 77    | 266.85    | 1309.53   | 29                           | 91    | 21.080    | 59.0689   | 43                           | 78    | 232.07    | 1094.83   | 30                           | 91    | 20.173    | 56.5142   |
| 44                           | 78    | 221.39    | 1042.68   | 30                           | 92    | 14.062    | 37.9889   | 44                           | 79    | 190.65    | 862.759   | 31                           | 92    | 13.455    | 36.3412   |
| 45                           | 79    | 181.80    | 821.286   | 31                           | 93    | 9.1600    | 23.9269   | 45                           | 80    | 154.84    | 672.109   | 32                           | 93    | 8.7635    | 22.8862   |
| 46                           | 80    | 147.58    | 639.486   | 32                           | 94    | 5.8326    | 14.7669   | 46                           | 81    | 124.28    | 517.269   | 33                           | 94    | 5.5795    | 14.1227   |
| 47                           | 81    | 118.40    | 491.906   | 33                           | 95    | 3.6286    | 8.93431   | 47                           | 82    | 98.471    | 392.989   | 34                           | 95    | 3.4706    | 8.54317   |
| 48                           | 82    | 93.762    | 373.506   | 34                           | 96    | 2.2065    | 5.30571   | 48                           | 83    | 76.993    | 294.518   | 35                           | 96    | 2.1101    | 5.07257   |
| 49                           | 83    | 73.271    | 279.744   | 35                           | 97    | 1.3134    | 3.09921   | 49                           | 84    | 59.357    | 217.525   | 36                           | 97    | 1.2558    | 2.96247   |
| 50                           | 84    | 56.453    | 206.473   | 36                           | 98    | .76631    | 1.78581   | 50                           | 85    | 45.080    | 158.168   | 37                           | 98    | .73257    | 1.70667   |
| 51                           | 85    | 42.846    | 150.020   | 37                           | 99    | .44561    | 1.01950   | 51                           | 86    | 33.667    | 113.088   | 38                           | 99    | .42590    | .97410    |
| 52                           | 86    | 31.974    | 107.174   | 38                           | 100   | .25733    | .57389    | 52                           | 87    | 24.700    | 79.4206   | 39                           | 100   | .24590    | .54820    |
| 53                           | 87    | 23.439    | 75.2002   | 39                           | 101   | .14263    | .31656    | 53                           | 88    | 17.726    | 54.7206   | 40                           | 101   | .13625    | .30230    |
| 54                           | 88    | 16.805    | 51.7612   | 40                           | 102   | .08154    | .17393    | 54                           | 89    | 12.494    | 36.9946   | 41                           | 102   | .07787    | .16605    |
| 55                           | 89    | 11.833    | 34.9562   | 41                           | 103   | .04633    | .09239    | 55                           | 90    | 8.6142    | 24.5006   | 42                           | 103   | .04423    | .08818    |
| 56                           | 90    | 8.1490    | 23.1232   | 42                           | 104   | .02672    | .04606    | 56                           | 91    | 5.8070    | 15.8864   | 43                           | 104   | .02550    | .04395    |
| 57                           | 91    | 5.4869    | 14.9742   | 43                           | 105   | .01479    | .01934    | 57                           | 92    | 3.8247    | 10.0794   | 44                           | 105   | .01411    | .01845    |
| 58                           | 92    | 3.6090    | 9.48730   | 44                           | 106   | .00455    | .00455    | 58                           | 93    | 2.4569    | 6.25471   | 45                           | 106   | .00434    | .00434    |
| 59                           | 93    | 2.3152    | 5.87830   |                              |       |           |           | 59                           | 94    | 1.5409    | 3.79781   |                              |       |           |           |
| 60                           | 94    | 1.4496    | 3.56310   |                              |       |           |           | 60                           | 95    | .94277    | 2.25691   |                              |       |           |           |

62 YEARS.

61 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 36 YEARS. |    |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 37 YEARS. |    |                  |                  |                              |     |                  |                  |
|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                           | y. |                  |                  | x.                           | y.  |                  |                  | x.                           | y. |                  |                  | x.                           | y.  |                  |                  |
| 10                           | 46 | 10635            | 111403           | 61                           | 97  | ·35039           | ·80373           | 10                           | 47 | 10132            | 105080           | 61                           | 98  | ·21381           | ·48501           |
| 11                           | 47 | 9717·2           | 100768           | 62                           | 98  | ·20042           | ·45334           | 11                           | 48 | 9252·6           | 94948·4          | 62                           | 99  | ·12191           | ·27120           |
| 12                           | 48 | 8882·0           | 91050·7          | 63                           | 99  | ·11403           | ·25292           | 12                           | 49 | 8452·6           | 85695·8          | 63                           | 100 | ·06890           | ·14929           |
| 13                           | 49 | 8119·7           | 82168·7          | 64                           | 100 | ·06430           | ·13889           | 13                           | 50 | 7722·4           | 77243·2          | 64                           | 101 | ·03729           | ·08039           |
| 14                           | 50 | 7421·6           | 74049·0          | 65                           | 101 | ·03471           | ·07459           | 14                           | 51 | 7053·8           | 69520·8          | 65                           | 102 | ·02077           | ·04310           |
| 15                           | 51 | 6780·3           | 66627·4          | 66                           | 102 | ·01928           | ·03988           | 15                           | 52 | 6439·3           | 62467·0          | 66                           | 103 | ·01147           | ·02233           |
| 16                           | 52 | 6188·9           | 59847·1          | 67                           | 103 | ·01061           | ·02060           | 16                           | 53 | 5872·8           | 56027·7          | 67                           | 104 | ·00641           | ·01086           |
| 17                           | 53 | 5642·2           | 53658·2          | 68                           | 104 | ·00591           | ·00999           | 17                           | 54 | 5349·0           | 50154·9          | 68                           | 105 | ·00343           | ·00445           |
| 18                           | 54 | 5136·7           | 48016·0          | 69                           | 105 | ·00315           | ·00408           | 18                           | 55 | 4864·7           | 44805·9          | 69                           | 106 | ·00102           | ·00102           |
| 19                           | 55 | 4669·5           | 42879·3          | 70                           | 106 | ·00093           | ·00093           | 19                           | 56 | 4417·4           | 39941·2          | DIFFERENCE OF AGE, 59 YEARS. |     |                  |                  |
| 20                           | 56 | 4238·4           | 38209·8          | DIFFERENCE OF AGE, 60 YEARS. |     |                  |                  | 20                           | 57 | 4004·8           | 35523·8          |                              |     |                  |                  |
| 21                           | 57 | 3841·3           | 33971·4          |                              |     |                  |                  | 21                           | 58 | 3624·6           | 31519·0          | 10                           | 69  | 2613·4           | 17574·6          |
| 22                           | 58 | 3475·5           | 30130·1          | 10                           | 70  | 2391·8           | 15584·1          | 22                           | 59 | 3274·9           | 27894·4          | 11                           | 70  | 2294·0           | 14961·2          |
| 23                           | 59 | 3139·2           | 26654·6          | 11                           | 71  | 2090·5           | 13192·3          | 23                           | 60 | 2953·4           | 24619·5          | 12                           | 71  | 2006·7           | 12667·2          |
| 24                           | 60 | 2830·1           | 23515·4          | 12                           | 72  | 1819·8           | 11101·8          | 24                           | 61 | 2658·0           | 21666·1          | 13                           | 72  | 1748·1           | 10660·5          |
| 25                           | 61 | 2546·3           | 20685·3          | 13                           | 73  | 1577·0           | 9281·98          | 25                           | 62 | 2386·8           | 19008·1          | 14                           | 73  | 1515·5           | 8912·37          |
| 26                           | 62 | 2285·8           | 18139·0          | 14                           | 74  | 1359·0           | 7704·98          | 26                           | 63 | 2138·1           | 16621·3          | 15                           | 74  | 1306·3           | 7396·87          |
| 27                           | 63 | 2047·1           | 15853·2          | 15                           | 75  | 1164·0           | 6345·98          | 27                           | 64 | 1910·3           | 14483·2          | 16                           | 75  | 1118·7           | 6090·57          |
| 28                           | 64 | 1828·6           | 13806·1          | 16                           | 76  | 989·54           | 5181·98          | 28                           | 65 | 1702·1           | 12572·9          | 17                           | 76  | 950·68           | 4971·87          |
| 29                           | 65 | 1629·0           | 11977·5          | 17                           | 77  | 834·34           | 4192·44          | 29                           | 66 | 1511·9           | 10870·8          | 18                           | 77  | 801·22           | 4021·19          |
| 30                           | 66 | 1446·8           | 10348·5          | 18                           | 78  | 696·80           | 3358·10          | 30                           | 67 | 1338·8           | 9358·94          | 19                           | 78  | 668·85           | 3219·97          |
| 31                           | 67 | 1281·0           | 8901·73          | 19                           | 79  | 575·98           | 2661·30          | 31                           | 68 | 1181·3           | 8020·14          | 20                           | 79  | 552·65           | 2551·12          |
| 32                           | 68 | 1130·2           | 7620·73          | 20                           | 80  | 470·69           | 2085·32          | 32                           | 69 | 1038·5           | 6838·84          | 21                           | 80  | 451·47           | 1998·47          |
| 33                           | 69 | 948·73           | 6490·53          | 21                           | 81  | 380·19           | 1614·63          | 33                           | 70 | 909·22           | 5800·34          | 22                           | 81  | 364·54           | 1547·00          |
| 34                           | 70 | 869·63           | 5541·80          | 22                           | 82  | 303·18           | 1234·44          | 34                           | 71 | 792·49           | 4891·12          | 23                           | 82  | 290·62           | 1182·46          |
| 35                           | 71 | 757·87           | 4672·17          | 23                           | 83  | 238·64           | 931·263          | 35                           | 72 | 687·26           | 4098·63          | 24                           | 83  | 228·69           | 891·839          |
| 36                           | 72 | 657·13           | 3914·30          | 24                           | 84  | 185·26           | 692·623          | 36                           | 73 | 592·78           | 3411·37          | 25                           | 84  | 177·47           | 663·149          |
| 37                           | 73 | 566·68           | 3257·17          | 25                           | 85  | 141·72           | 507·363          | 37                           | 74 | 508·14           | 2818·59          | 26                           | 85  | 135·72           | 485·679          |
| 38                           | 74 | 485·67           | 2690·49          | 26                           | 86  | 106·65           | 365·643          | 38                           | 75 | 432·76           | 2310·45          | 27                           | 86  | 102·11           | 349·959          |
| 39                           | 75 | 413·53           | 2204·82          | 27                           | 87  | 78·880           | 258·993          | 39                           | 76 | 365·78           | 1877·69          | 28                           | 87  | 75·509           | 247·849          |
| 40                           | 76 | 349·43           | 1791·29          | 28                           | 88  | 57·106           | 180·113          | 40                           | 77 | 306·66           | 1511·91          | 29                           | 88  | 54·656           | 172·340          |
| 41                           | 77 | 292·87           | 1441·86          | 29                           | 89  | 40·636           | 123·007          | 41                           | 78 | 254·70           | 1205·25          | 30                           | 89  | 38·887           | 117·684          |
| 42                           | 78 | 243·16           | 1148·99          | 30                           | 90  | 28·309           | 82·3715          | 42                           | 79 | 209·40           | 950·548          | 31                           | 90  | 27·087           | 78·7968          |
| 43                           | 79 | 199·85           | 905·828          | 31                           | 91  | 19·302           | 54·0625          | 43                           | 80 | 170·21           | 741·148          | 32                           | 91  | 18·467           | 51·7098          |
| 44                           | 80 | 162·38           | 705·978          | 32                           | 92  | 12·873           | 34·7605          | 44                           | 81 | 136·74           | 570·938          | 33                           | 92  | 12·314           | 33·2428          |
| 45                           | 81 | 130·39           | 543·598          | 33                           | 93  | 8·3832           | 21·8875          | 45                           | 82 | 108·44           | 434·198          | 34                           | 93  | 8·0181           | 20·9288          |
| 46                           | 82 | 103·36           | 413·208          | 34                           | 94  | 5·3365           | 13·5043          | 46                           | 83 | 84·876           | 325·758          | 35                           | 94  | 5·1034           | 12·9107          |
| 47                           | 83 | 80·860           | 309·848          | 35                           | 95  | 3·3190           | 8·16775          | 47                           | 84 | 65·505           | 240·882          | 36                           | 95  | 3·1735           | 7·80729          |
| 48                           | 84 | 62·373           | 228·988          | 36                           | 96  | 2·0176           | 4·84875          | 48                           | 85 | 49·807           | 175·377          | 37                           | 96  | 1·9288           | 4·63379          |
| 49                           | 85 | 47·399           | 166·615          | 37                           | 97  | 1·2005           | 2·83115          | 49                           | 86 | 37·245           | 125·570          | 38                           | 97  | 1·1474           | 2·70499          |
| 50                           | 86 | 35·422           | 119·216          | 38                           | 98  | ·70017           | 1·63065          | 50                           | 87 | 27·364           | 88·3254          | 39                           | 98  | ·66905           | 1·55759          |
| 51                           | 87 | 26·008           | 83·7943          | 39                           | 99  | ·40697           | ·93048           | 51                           | 88 | 19·670           | 60·9614          | 40                           | 99  | ·38878           | ·88854           |
| 52                           | 88 | 18·681           | 57·7863          | 40                           | 100 | ·23490           | ·52351           | 52                           | 89 | 13·889           | 41·2914          | 41                           | 100 | ·22434           | ·49976           |
| 53                           | 89 | 13·179           | 39·1053          | 41                           | 101 | ·13013           | ·28861           | 53                           | 90 | 9·5944           | 27·4024          | 42                           | 101 | ·12423           | ·27542           |
| 54                           | 90 | 9·0958           | 25·9263          | 42                           | 102 | ·07435           | ·15848           | 54                           | 91 | 6·4817           | 17·8080          | 43                           | 102 | ·07095           | ·15119           |
| 55                           | 91 | 6·1385           | 16·8305          | 43                           | 103 | ·04221           | ·08413           | 55                           | 92 | 4·2789           | 11·3263          | 44                           | 103 | ·04027           | ·08024           |
| 56                           | 92 | 4·0478           | 10·6920          | 44                           | 104 | ·02433           | ·04192           | 56                           | 93 | 2·7557           | 7·04741          | 45                           | 104 | ·02320           | ·03997           |
| 57                           | 93 | 2·6038           | 6·64423          | 45                           | 105 | ·01346           | ·01759           | 57                           | 94 | 1·7330           | 4·29171          | 46                           | 105 | ·01283           | ·01677           |
| 58                           | 94 | 1·6352           | 4·04043          | 46                           | 106 | ·00413           | ·00413           | 58                           | 95 | 1·0635           | 2·55871          | 47                           | 106 | ·00394           | ·00394           |
| 59                           | 95 | 1·0021           | 2·40523          |                              |     |                  |                  | 59                           | 96 | ·63712           | 1·49521          |                              |     |                  |                  |
| 60                           | 96 | ·59940           | 1·40313          |                              |     |                  |                  | 60                           | 97 | ·37308           | ·85809           |                              |     |                  |                  |

60 YEARS.

59 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 38 YEARS. |    |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 39 YEARS. |    |                  |                  |                              |     |                  |                  |
|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|------------------------------|----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |    | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                           | y. |                  |                  | x.                           | y.  |                  |                  | x.                           | y. |                  |                  | x.                           | y.  |                  |                  |
| 10                           | 48 | 9647.2           | 98964.7          | 61                           | 99  | 13006            | 29013            | 10                           | 49 | 9180.8           | 93093.1          | 61                           | 100 | 07858            | 17120            |
| 11                           | 49 | 8805.2           | 89317.5          | 62                           | 100 | 07366            | 16007            | 11                           | 50 | 8374.4           | 83912.3          | 62                           | 101 | 04273            | 09262            |
| 12                           | 50 | 8039.0           | 80512.3          | 63                           | 101 | 03997            | 08641            | 12                           | 51 | 7640.6           | 75537.9          | 63                           | 102 | 02392            | 04989            |
| 13                           | 51 | 7339.7           | 72473.3          | 64                           | 102 | 02232            | 04644            | 13                           | 52 | 6970.6           | 67897.3          | 64                           | 103 | 01328            | 02597            |
| 14                           | 52 | 6699.1           | 65133.6          | 65                           | 103 | 01236            | 02412            | 14                           | 53 | 6356.9           | 60926.7          | 65                           | 104 | 00747            | 01269            |
| 15                           | 53 | 6110.4           | 58434.5          | 66                           | 104 | 00693            | 01176            | 15                           | 54 | 5792.9           | 54569.8          | 66                           | 105 | 00402            | 00522            |
| 16                           | 54 | 5567.6           | 52324.1          | 67                           | 105 | 00372            | 00483            | 16                           | 55 | 5272.9           | 48776.9          | 67                           | 106 | 00120            | 00120            |
| 17                           | 55 | 5065.8           | 46756.5          | 68                           | 106 | 00111            | 00111            | 17                           | 56 | 4792.2           | 43504.0          | DIFFERENCE OF AGE, 57 YEARS. |     |                  |                  |
| 18                           | 56 | 4602.0           | 41690.7          | DIFFERENCE OF AGE, 58 YEARS. |     |                  |                  | 18                           | 57 | 4348.3           | 38711.8          |                              |     |                  |                  |
| 19                           | 57 | 4173.9           | 37088.7          |                              |     |                  |                  | 19                           | 58 | 3938.5           | 34363.5          |                              |     |                  |                  |
| 20                           | 58 | 3778.9           | 32914.8          |                              |     |                  |                  | 20                           | 59 | 3560.9           | 30425.0          |                              |     |                  |                  |
| 21                           | 59 | 3415.4           | 29135.9          | 10                           | 68  | 2844.0           | 19715.9          | 21                           | 60 | 3213.2           | 26864.1          | 10                           | 67  | 3084.0           | 22010.9          |
| 22                           | 60 | 3081.0           | 25720.5          | 11                           | 69  | 2506.4           | 16871.9          | 22                           | 61 | 2893.7           | 23650.9          | 11                           | 68  | 2727.6           | 18926.9          |
| 23                           | 61 | 2773.8           | 22639.5          | 12                           | 70  | 2202.1           | 14365.5          | 23                           | 62 | 2600.0           | 20757.2          | 12                           | 69  | 2406.0           | 16199.3          |
| 24                           | 62 | 2491.5           | 19865.7          | 13                           | 71  | 1927.7           | 12163.4          | 24                           | 63 | 2330.5           | 18157.2          | 13                           | 70  | 2115.4           | 13793.3          |
| 25                           | 63 | 2232.6           | 17374.2          | 14                           | 72  | 1680.0           | 10235.7          | 25                           | 64 | 2083.3           | 15826.7          | 14                           | 71  | 1852.6           | 11677.9          |
| 26                           | 64 | 1995.2           | 15141.6          | 15                           | 73  | 1456.8           | 8555.65          | 26                           | 65 | 1857.1           | 13743.4          | 15                           | 72  | 1614.9           | 9825.30          |
| 27                           | 65 | 1778.1           | 13146.4          | 16                           | 74  | 1255.5           | 7098.85          | 27                           | 66 | 1650.2           | 11886.3          | 16                           | 73  | 1400.1           | 8210.40          |
| 28                           | 66 | 1579.7           | 11368.3          | 17                           | 75  | 1074.8           | 5843.35          | 28                           | 67 | 1461.7           | 10236.1          | 17                           | 74  | 1206.2           | 6810.30          |
| 29                           | 67 | 1399.0           | 9788.64          | 18                           | 76  | 912.94           | 4768.55          | 29                           | 68 | 1290.1           | 8774.41          | 18                           | 75  | 1032.1           | 5604.10          |
| 30                           | 68 | 1234.6           | 8389.64          | 19                           | 77  | 769.08           | 3855.61          | 30                           | 69 | 1134.5           | 7484.31          | 19                           | 76  | 876.32           | 4572.00          |
| 31                           | 69 | 1085.5           | 7155.04          | 20                           | 78  | 641.76           | 3086.53          | 31                           | 70 | 993.47           | 6349.81          | 20                           | 77  | 737.93           | 3695.68          |
| 32                           | 70 | 950.47           | 6069.54          | 21                           | 79  | 530.07           | 2444.77          | 32                           | 71 | 866.16           | 5356.34          | 21                           | 78  | 615.54           | 2957.75          |
| 33                           | 71 | 828.57           | 5119.07          | 22                           | 80  | 432.89           | 1914.70          | 33                           | 72 | 751.38           | 4490.18          | 22                           | 79  | 508.26           | 2342.21          |
| 34                           | 72 | 718.66           | 4290.50          | 23                           | 81  | 349.44           | 1481.81          | 34                           | 73 | 648.29           | 3738.80          | 23                           | 80  | 414.96           | 1833.95          |
| 35                           | 73 | 619.97           | 3571.84          | 24                           | 82  | 278.49           | 1132.37          | 35                           | 74 | 555.92           | 3090.51          | 24                           | 81  | 334.86           | 1418.99          |
| 36                           | 74 | 531.55           | 2951.87          | 25                           | 83  | 219.07           | 853.881          | 36                           | 75 | 473.64           | 2534.59          | 25                           | 82  | 266.79           | 1084.13          |
| 37                           | 75 | 452.78           | 2420.32          | 26                           | 84  | 169.96           | 634.811          | 37                           | 76 | 400.51           | 2060.95          | 26                           | 83  | 209.80           | 817.345          |
| 38                           | 76 | 382.80           | 1967.54          | 27                           | 85  | 129.95           | 464.851          | 38                           | 77 | 335.95           | 1660.44          | 27                           | 84  | 162.73           | 607.545          |
| 39                           | 77 | 321.02           | 1584.74          | 28                           | 86  | 97.744           | 334.901          | 39                           | 78 | 279.18           | 1324.49          | 28                           | 85  | 124.39           | 444.815          |
| 40                           | 78 | 266.70           | 1263.72          | 29                           | 87  | 72.268           | 237.157          | 40                           | 79 | 229.67           | 1045.31          | 29                           | 86  | 93.549           | 320.425          |
| 41                           | 79 | 219.34           | 997.025          | 30                           | 88  | 52.303           | 164.889          | 41                           | 80 | 186.81           | 815.636          | 30                           | 87  | 69.158           | 226.876          |
| 42                           | 80 | 178.35           | 777.685          | 31                           | 89  | 37.209           | 112.586          | 42                           | 81 | 150.19           | 628.826          | 31                           | 88  | 50.046           | 157.718          |
| 43                           | 81 | 143.34           | 599.335          | 32                           | 90  | 25.915           | 75.3773          | 43                           | 82 | 119.21           | 478.636          | 32                           | 89  | 35.598           | 107.672          |
| 44                           | 82 | 113.72           | 455.995          | 33                           | 91  | 17.666           | 49.4623          | 44                           | 83 | 93.385           | 359.426          | 33                           | 90  | 24.790           | 72.0738          |
| 45                           | 83 | 89.049           | 342.275          | 34                           | 92  | 11.788           | 31.7963          | 45                           | 84 | 72.139           | 266.041          | 34                           | 91  | 16.896           | 47.2838          |
| 46                           | 84 | 68.759           | 253.226          | 35                           | 93  | 7.6678           | 20.0083          | 46                           | 85 | 54.906           | 193.902          | 35                           | 92  | 11.263           | 30.3878          |
| 47                           | 85 | 52.308           | 184.467          | 36                           | 94  | 4.8796           | 12.3405          | 47                           | 86 | 41.102           | 138.996          | 36                           | 93  | 7.3316           | 19.1248          |
| 48                           | 86 | 39.137           | 132.159          | 37                           | 95  | 3.0337           | 7.46093          | 48                           | 87 | 30.234           | 97.8944          | 37                           | 94  | 4.6648           | 11.7932          |
| 49                           | 87 | 28.772           | 93.0216          | 38                           | 96  | 1.8435           | 4.42723          | 49                           | 88 | 21.760           | 67.6604          | 38                           | 95  | 2.8996           | 7.12840          |
| 50                           | 88 | 20.695           | 64.2496          | 39                           | 97  | 1.0964           | 2.58373          | 50                           | 89 | 15.387           | 45.9004          | 39                           | 96  | 1.7616           | 4.22880          |
| 51                           | 89 | 14.624           | 43.5546          | 40                           | 98  | 0.63914          | 1.48373          | 51                           | 90 | 10.646           | 30.5134          | 40                           | 97  | 1.0474           | 2.46720          |
| 52                           | 90 | 10.111           | 28.9306          | 41                           | 99  | 0.37129          | 0.84819          | 52                           | 91 | 7.2050           | 19.8674          | 41                           | 98  | 0.61039          | 1.41980          |
| 53                           | 91 | 6.8369           | 18.8196          | 42                           | 100 | 0.21417          | 0.47690          | 53                           | 92 | 4.7658           | 12.6624          | 42                           | 99  | 0.35447          | 0.80941          |
| 54                           | 92 | 4.5181           | 11.9827          | 43                           | 101 | 0.11856          | 0.26273          | 54                           | 93 | 3.0759           | 7.89655          | 43                           | 100 | 0.20440          | 0.45494          |
| 55                           | 93 | 2.9130           | 7.46457          | 44                           | 102 | 0.06769          | 0.14417          | 55                           | 94 | 1.9388           | 4.82065          | 44                           | 101 | 0.11311          | 0.25054          |
| 56                           | 94 | 1.8341           | 4.55157          | 45                           | 103 | 0.03840          | 0.07648          | 56                           | 95 | 1.1928           | 2.88185          | 45                           | 102 | 0.06455          | 0.13743          |
| 57                           | 95 | 1.1270           | 2.71747          | 46                           | 104 | 0.02211          | 0.03808          | 57                           | 96 | 0.71655          | 1.68905          | 46                           | 103 | 0.03660          | 0.07288          |
| 58                           | 96 | 0.67614          | 1.59047          | 47                           | 105 | 0.01222          | 0.01597          | 58                           | 97 | 0.42084          | 0.97250          | 47                           | 104 | 0.02107          | 0.03628          |
| 59                           | 97 | 0.39655          | 0.91433          | 48                           | 106 | 0.00375          | 0.00375          | 59                           | 98 | 0.24198          | 0.55166          | 48                           | 105 | 0.01164          | 0.01521          |
| 60                           | 98 | 0.22765          | 0.51778          |                              |     |                  |                  | 60                           | 99 | 0.13848          | 0.30968          | 49                           | 106 | 0.00357          | 0.00357          |

58 YEARS.

7 F

57 YEARS.



TABLE 14—(continued).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

| DIFFERENCE OF AGE, 40 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 41 YEARS. |       |           |           |                              |       |           |           |
|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                           | 50    | 8731.6    | 87456.9   | 61                           | 101   | 04558     | 09903     | 10                           | 51    | 8298.9    | 82048.5   | 61                           | 102   | 02728     | 05714     |
| 11                           | 51    | 7959.4    | 78725.3   | 62                           | 102   | 02557     | 05345     | 11                           | 52    | 7559.1    | 73749.6   | 62                           | 103   | 01521     | 02986     |
| 12                           | 52    | 7256.4    | 70765.9   | 63                           | 103   | 01423     | 02788     | 12                           | 53    | 6885.7    | 66190.5   | 63                           | 104   | 00860     | 01465     |
| 13                           | 53    | 6614.5    | 63509.5   | 64                           | 104   | 00802     | 01365     | 13                           | 54    | 6270.8    | 59304.8   | 64                           | 105   | 00465     | 00605     |
| 14                           | 54    | 6026.5    | 56895.0   | 65                           | 105   | 00433     | 00563     | 14                           | 55    | 5707.5    | 53034.0   | 65                           | 106   | 00140     | 00140     |
| 15                           | 55    | 5486.2    | 50868.5   | 66                           | 106   | 00130     | 00130     | 15                           | 56    | 5189.9    | 47326.5   | DIFFERENCE OF AGE, 55 YEARS. |       |           |           |
| 16                           | 56    | 4988.1    | 45382.3   | DIFFERENCE OF AGE, 56 YEARS. |       |           |           | 16                           | 57    | 4713.2    | 42136.6   |                              |       |           |           |
| 17                           | 57    | 4528.1    | 40394.2   |                              |       |           |           | 17                           | 58    | 4272.7    | 37423.4   | 10                           | 65    | 3591.1    | 27073.5   |
| 18                           | 58    | 4103.1    | 35866.1   | 10                           | 66    | 3332.9    | 24463.6   | 18                           | 59    | 3866.3    | 33150.7   | 11                           | 66    | 3196.6    | 23482.4   |
| 19                           | 59    | 3711.2    | 31763.0   | 11                           | 67    | 2958.8    | 21130.7   | 19                           | 60    | 3491.5    | 29284.4   | 12                           | 67    | 2839.3    | 20285.8   |
| 20                           | 60    | 3350.1    | 28051.8   | 12                           | 68    | 2618.4    | 18171.9   | 20                           | 61    | 3146.4    | 25792.9   | 13                           | 68    | 2515.3    | 17446.5   |
| 21                           | 61    | 3017.8    | 24701.7   | 13                           | 69    | 2311.3    | 15553.5   | 21                           | 62    | 2828.8    | 22646.5   | 14                           | 69    | 2221.3    | 14931.2   |
| 22                           | 62    | 2712.4    | 21683.9   | 14                           | 70    | 2033.0    | 13242.2   | 22                           | 63    | 2537.2    | 19817.8   | 15                           | 70    | 1954.1    | 12709.9   |
| 23                           | 63    | 2432.0    | 18971.5   | 15                           | 71    | 1780.8    | 11209.2   | 23                           | 64    | 2269.5    | 17280.6   | 16                           | 71    | 1711.6    | 10755.8   |
| 24                           | 64    | 2174.8    | 16539.5   | 16                           | 72    | 1552.1    | 9428.42   | 24                           | 65    | 2024.2    | 15011.1   | 17                           | 72    | 1491.1    | 9044.22   |
| 25                           | 65    | 1939.1    | 14364.7   | 17                           | 73    | 1345.1    | 7876.32   | 25                           | 66    | 1799.7    | 12986.9   | 18                           | 73    | 1291.7    | 7553.12   |
| 26                           | 66    | 1723.5    | 12425.6   | 18                           | 74    | 1158.3    | 6531.22   | 26                           | 67    | 1594.8    | 11187.2   | 19                           | 74    | 1111.8    | 6261.42   |
| 27                           | 67    | 1527.0    | 10702.1   | 19                           | 75    | 990.70    | 5372.92   | 27                           | 68    | 1408.1    | 9592.39   | 20                           | 75    | 950.57    | 5149.62   |
| 28                           | 68    | 1347.9    | 9175.10   | 20                           | 76    | 840.83    | 4382.22   | 28                           | 69    | 1238.6    | 8184.29   | 21                           | 76    | 806.48    | 4199.05   |
| 29                           | 69    | 1185.5    | 7827.20   | 21                           | 77    | 707.79    | 3541.39   | 29                           | 70    | 1085.0    | 6945.69   | 22                           | 77    | 678.66    | 3392.57   |
| 30                           | 70    | 1038.3    | 6641.70   | 22                           | 78    | 590.22    | 2833.60   | 30                           | 71    | 946.18    | 5860.69   | 23                           | 78    | 565.76    | 2713.91   |
| 31                           | 71    | 905.35    | 5603.40   | 23                           | 79    | 487.21    | 2243.38   | 31                           | 72    | 821.00    | 4914.51   | 24                           | 79    | 466.87    | 2148.15   |
| 32                           | 72    | 785.46    | 4698.05   | 24                           | 80    | 397.64    | 1756.17   | 32                           | 73    | 708.55    | 4093.51   | 25                           | 80    | 380.92    | 1681.28   |
| 33                           | 73    | 677.80    | 3912.59   | 25                           | 81    | 320.78    | 1358.53   | 33                           | 74    | 607.78    | 3384.96   | 26                           | 81    | 307.20    | 1300.36   |
| 34                           | 74    | 581.32    | 3234.79   | 26                           | 82    | 255.50    | 1037.75   | 34                           | 75    | 517.99    | 2777.18   | 27                           | 82    | 244.63    | 993.161   |
| 35                           | 75    | 495.36    | 2653.47   | 27                           | 83    | 200.88    | 782.253   | 35                           | 76    | 438.17    | 2259.19   | 28                           | 83    | 192.29    | 748.531   |
| 36                           | 76    | 418.95    | 2158.11   | 28                           | 84    | 155.78    | 581.373   | 36                           | 77    | 367.68    | 1821.02   | 29                           | 84    | 149.09    | 556.241   |
| 37                           | 77    | 351.49    | 1739.16   | 29                           | 85    | 119.05    | 425.593   | 37                           | 78    | 305.68    | 1453.34   | 30                           | 85    | 113.93    | 407.151   |
| 38                           | 78    | 292.17    | 1387.67   | 30                           | 86    | 89.523    | 306.543   | 38                           | 79    | 251.60    | 1147.66   | 31                           | 86    | 85.660    | 293.221   |
| 39                           | 79    | 240.42    | 1095.50   | 31                           | 87    | 66.173    | 217.020   | 39                           | 80    | 204.76    | 896.065   | 32                           | 87    | 63.309    | 207.561   |
| 40                           | 80    | 195.61    | 855.081   | 32                           | 88    | 47.880    | 150.847   | 40                           | 81    | 164.72    | 691.305   | 33                           | 88    | 45.802    | 144.252   |
| 41                           | 81    | 157.32    | 659.471   | 33                           | 89    | 34.053    | 102.967   | 41                           | 82    | 130.84    | 626.585   | 34                           | 89    | 32.570    | 98.4504   |
| 42                           | 82    | 124.91    | 502.151   | 34                           | 90    | 23.711    | 68.9139   | 42                           | 83    | 102.57    | 395.745   | 35                           | 90    | 22.675    | 65.8804   |
| 43                           | 83    | 97.889    | 377.241   | 35                           | 91    | 16.158    | 45.2029   | 43                           | 84    | 79.301    | 293.175   | 36                           | 91    | 15.450    | 43.2054   |
| 44                           | 84    | 75.652    | 279.352   | 36                           | 92    | 10.769    | 29.0449   | 44                           | 85    | 60.411    | 213.847   | 37                           | 92    | 10.295    | 27.7554   |
| 45                           | 85    | 57.606    | 203.700   | 37                           | 93    | 7.0088    | 18.2759   | 45                           | 86    | 45.265    | 153.463   | 38                           | 93    | 6.6989    | 17.4604   |
| 46                           | 86    | 43.144    | 146.094   | 38                           | 94    | 4.4585    | 11.2671   | 46                           | 87    | 33.329    | 108.198   | 39                           | 94    | 4.2603    | 10.7615   |
| 47                           | 87    | 31.752    | 102.950   | 39                           | 95    | 2.7707    | 6.80859   | 47                           | 88    | 24.014    | 74.8687   | 40                           | 95    | 2.6468    | 6.50116   |
| 48                           | 88    | 22.866    | 71.1975   | 40                           | 96    | 1.6828    | 4.03789   | 48                           | 89    | 17.000    | 50.8547   | 41                           | 96    | 1.6071    | 3.85436   |
| 49                           | 89    | 16.178    | 48.3315   | 41                           | 97    | 1.0003    | 2.35509   | 49                           | 90    | 11.778    | 33.8547   | 42                           | 97    | 0.95498   | 2.24726   |
| 50                           | 90    | 11.201    | 32.1535   | 42                           | 98    | 0.58274   | 1.35479   | 50                           | 91    | 7.9820    | 22.0767   | 43                           | 98    | 0.55615   | 1.29228   |
| 51                           | 91    | 7.5866    | 20.9525   | 43                           | 99    | 0.33829   | 0.77205   | 51                           | 92    | 5.2882    | 14.0947   | 44                           | 99    | 0.32273   | 0.73613   |
| 52                           | 92    | 5.0223    | 13.3659   | 44                           | 100   | 0.19500   | 0.43376   | 52                           | 93    | 3.4191    | 8.80653   | 45                           | 100   | 0.18594   | 0.41340   |
| 53                           | 93    | 3.2445    | 8.34364   | 45                           | 101   | 0.10785   | 0.23876   | 53                           | 94    | 2.1594    | 5.38743   | 46                           | 101   | 0.10280   | 0.22746   |
| 54                           | 94    | 2.0472    | 5.09914   | 46                           | 102   | 0.06152   | 0.13091   | 54                           | 95    | 1.3314    | 3.22803   | 47                           | 102   | 0.05861   | 0.12466   |
| 55                           | 95    | 1.2609    | 3.05194   | 47                           | 103   | 0.03487   | 0.06939   | 55                           | 96    | 0.80165   | 1.89663   | 48                           | 103   | 0.03320   | 0.06605   |
| 56                           | 96    | 0.75835   | 1.79104   | 48                           | 104   | 0.02006   | 0.03452   | 56                           | 97    | 0.47201   | 1.09498   | 49                           | 104   | 0.01909   | 0.03285   |
| 57                           | 97    | 0.44600   | 1.03269   | 49                           | 105   | 0.01107   | 0.01446   | 57                           | 98    | 0.27215   | 0.62297   | 50                           | 105   | 0.01053   | 0.01376   |
| 58                           | 98    | 0.25680   | 0.58669   | 50                           | 106   | 0.00339   | 0.00339   | 58                           | 99    | 0.15621   | 0.35082   | 51                           | 106   | 0.00323   | 0.00323   |
| 59                           | 99    | 0.14719   | 0.32989   |                              |       |           |           | 59                           | 100   | 0.08894   | 0.19461   |                              |       |           |           |
| 60                           | 100   | 0.08367   | 0.18270   |                              |       |           |           | 60                           | 101   | 0.04853   | 0.10567   |                              |       |           |           |

56 YEARS.

55 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 42 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 43 YEARS. |       |           |           |                              |       |           |           |
|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                           | 52    | 7881.5    | 76860.3   | 61                           | 103   | 01623     | 03191     | 10                           | 53    | 7479.0    | 71886.5   | 61                           | 104   | 00981     | 01675     |
| 11                           | 53    | 7173.0    | 68978.8   | 62                           | 104   | 00919     | 01568     | 11                           | 54    | 6800.2    | 64407.5   | 62                           | 105   | 00533     | 00694     |
| 12                           | 54    | 6527.9    | 61805.8   | 63                           | 105   | 00499     | 00649     | 12                           | 55    | 6182.3    | 57607.3   | 63                           | 106   | 00161     | 00161     |
| 13                           | 55    | 5938.8    | 55277.9   | 64                           | 106   | 00150     | 00150     | 13                           | 56    | 5618.1    | 51425.0   | DIFFERENCE OF AGE, 53 YEARS. |       |           |           |
| 14                           | 56    | 5399.2    | 49339.1   | DIFFERENCE OF AGE, 54 YEARS. |       |           |           | 14                           | 57    | 5101.7    | 45806.9   |                              |       |           |           |
| 15                           | 57    | 4903.8    | 43939.9   |                              |       |           |           | 15                           | 58    | 4627.2    | 40705.2   |                              |       |           |           |
| 16                           | 58    | 4447.3    | 39036.1   |                              |       |           |           | 16                           | 59    | 4190.7    | 36078.0   |                              |       |           |           |
| 17                           | 59    | 4026.1    | 34588.8   | 10                           | 64    | 3858.2    | 29846.3   | 17                           | 60    | 3787.7    | 31887.3   | 10                           | 63    | 4134.5    | 32783.2   |
| 18                           | 60    | 3637.4    | 30562.7   | 11                           | 65    | 3444.2    | 25988.1   | 18                           | 61    | 3416.2    | 28099.6   | 11                           | 64    | 3700.3    | 2864.87   |
| 19                           | 61    | 3279.2    | 26925.3   | 12                           | 66    | 3068.5    | 22543.9   | 19                           | 62    | 3073.7    | 24683.4   | 12                           | 65    | 3306.2    | 24948.4   |
| 20                           | 62    | 2949.2    | 23646.1   | 13                           | 67    | 2727.5    | 19475.4   | 20                           | 63    | 2758.7    | 21609.7   | 13                           | 66    | 2947.7    | 21642.2   |
| 21                           | 63    | 2646.0    | 20696.9   | 14                           | 68    | 2417.3    | 16747.9   | 21                           | 64    | 2469.2    | 18851.0   | 14                           | 67    | 2621.3    | 18694.5   |
| 22                           | 64    | 2367.6    | 18050.9   | 15                           | 69    | 2135.1    | 14330.6   | 22                           | 65    | 2203.7    | 16381.8   | 15                           | 68    | 2323.6    | 16073.2   |
| 23                           | 65    | 2112.4    | 15683.3   | 16                           | 70    | 1878.2    | 12195.5   | 23                           | 66    | 1960.5    | 14178.1   | 16                           | 69    | 2052.1    | 13749.6   |
| 24                           | 66    | 1878.7    | 13570.9   | 17                           | 71    | 1644.3    | 10317.3   | 24                           | 67    | 1738.4    | 12217.6   | 17                           | 70    | 1804.4    | 11697.5   |
| 25                           | 67    | 1665.3    | 11692.2   | 18                           | 72    | 1432.0    | 8672.95   | 25                           | 68    | 1535.7    | 10479.2   | 18                           | 71    | 1579.1    | 9893.13   |
| 26                           | 68    | 1470.7    | 10026.9   | 19                           | 73    | 1239.9    | 7240.95   | 26                           | 69    | 1351.4    | 8943.53   | 19                           | 72    | 1374.5    | 8314.03   |
| 27                           | 69    | 1293.9    | 8556.22   | 20                           | 74    | 1066.8    | 6001.05   | 27                           | 70    | 1184.2    | 7592.13   | 20                           | 73    | 1189.7    | 6939.53   |
| 28                           | 70    | 1133.6    | 7262.32   | 21                           | 75    | 911.75    | 4934.25   | 28                           | 71    | 1033.1    | 6407.93   | 21                           | 74    | 1023.2    | 5749.83   |
| 29                           | 71    | 988.73    | 6128.72   | 22                           | 76    | 773.30    | 4022.50   | 29                           | 72    | 896.62    | 5374.83   | 22                           | 75    | 874.23    | 4726.63   |
| 30                           | 72    | 858.03    | 5139.99   | 23                           | 77    | 650.55    | 3249.20   | 30                           | 73    | 774.02    | 4478.21   | 23                           | 76    | 741.26    | 3852.40   |
| 31                           | 73    | 740.62    | 4281.96   | 24                           | 78    | 542.15    | 2598.65   | 31                           | 74    | 664.10    | 3704.19   | 24                           | 77    | 623.40    | 3111.14   |
| 32                           | 74    | 635.36    | 3541.34   | 25                           | 79    | 447.25    | 2056.50   | 32                           | 75    | 566.14    | 3040.09   | 25                           | 78    | 519.36    | 2487.74   |
| 33                           | 75    | 541.57    | 2905.98   | 26                           | 80    | 364.80    | 1609.25   | 33                           | 76    | 479.04    | 2473.95   | 26                           | 79    | 428.32    | 1968.38   |
| 34                           | 76    | 458.18    | 2364.41   | 27                           | 81    | 294.13    | 1244.45   | 34                           | 77    | 402.11    | 1994.91   | 27                           | 80    | 349.28    | 1540.06   |
| 35                           | 77    | 384.54    | 1906.23   | 28                           | 82    | 234.17    | 950.325   | 35                           | 78    | 334.43    | 1592.80   | 28                           | 81    | 281.56    | 1190.78   |
| 36                           | 78    | 319.76    | 1521.69   | 29                           | 83    | 184.04    | 716.155   | 36                           | 79    | 275.36    | 1258.37   | 29                           | 82    | 224.12    | 909.224   |
| 37                           | 79    | 263.24    | 1201.93   | 30                           | 84    | 142.67    | 532.115   | 37                           | 80    | 224.20    | 983.013   | 30                           | 83    | 176.12    | 685.104   |
| 38                           | 80    | 214.29    | 938.695   | 31                           | 85    | 109.01    | 389.445   | 38                           | 81    | 180.45    | 758.813   | 31                           | 84    | 136.52    | 508.984   |
| 39                           | 81    | 172.43    | 724.405   | 32                           | 86    | 81.952    | 280.435   | 39                           | 82    | 143.41    | 578.363   | 32                           | 85    | 104.30    | 372.464   |
| 40                           | 82    | 137.00    | 551.975   | 33                           | 87    | 60.561    | 198.483   | 40                           | 83    | 112.50    | 434.953   | 33                           | 86    | 78.395    | 268.164   |
| 41                           | 83    | 107.44    | 414.975   | 34                           | 88    | 43.808    | 137.922   | 41                           | 84    | 87.035    | 322.453   | 34                           | 87    | 57.925    | 189.769   |
| 42                           | 84    | 83.093    | 307.535   | 35                           | 89    | 31.147    | 94.1135   | 42                           | 85    | 66.353    | 235.418   | 35                           | 88    | 41.894    | 131.844   |
| 43                           | 85    | 63.325    | 224.442   | 36                           | 90    | 21.681    | 62.9665   | 43                           | 86    | 49.759    | 169.065   | 36                           | 89    | 29.782    | 89.9496   |
| 44                           | 86    | 47.469    | 161.117   | 37                           | 91    | 14.769    | 41.2855   | 44                           | 87    | 36.670    | 119.306   | 37                           | 90    | 20.726    | 60.1676   |
| 45                           | 87    | 34.968    | 113.648   | 38                           | 92    | 9.8399    | 26.5165   | 45                           | 88    | 26.446    | 82.6363   | 38                           | 91    | 14.116    | 39.4416   |
| 46                           | 88    | 25.207    | 78.6797   | 39                           | 93    | 6.4012    | 16.6766   | 46                           | 89    | 18.741    | 56.1903   | 39                           | 92    | 9.4026    | 25.3256   |
| 47                           | 89    | 17.854    | 53.4727   | 40                           | 94    | 4.0698    | 10.2754   | 47                           | 90    | 12.997    | 37.4493   | 40                           | 93    | 6.1150    | 15.9230   |
| 48                           | 90    | 12.376    | 35.6187   | 41                           | 95    | 2.5278    | 6.20561   | 48                           | 91    | 8.8191    | 24.4523   | 41                           | 94    | 3.8868    | 9.80803   |
| 49                           | 91    | 8.3927    | 23.2427   | 42                           | 96    | 1.5343    | 3.67781   | 49                           | 92    | 5.8502    | 15.6332   | 42                           | 95    | 2.4133    | 5.92123   |
| 50                           | 92    | 5.5640    | 14.8500   | 43                           | 97    | 911.40    | 2.14351   | 50                           | 93    | 3.7879    | 9.78295   | 43                           | 96    | 1.4643    | 3.50793   |
| 51                           | 93    | 3.6002    | 9.28602   | 44                           | 98    | 53056     | 1.23211   | 51                           | 94    | 2.3961    | 5.99505   | 44                           | 97    | 86946     | 2.04363   |
| 52                           | 94    | 2.2756    | 5.68582   | 45                           | 99    | 30774     | 70155     | 52                           | 95    | 1.4799    | 3.59895   | 45                           | 98    | 50592     | 1.17417   |
| 53                           | 95    | 1.4043    | 3.41022   | 46                           | 100   | 17723     | 39381     | 53                           | 96    | 89286     | 2.11905   | 46                           | 99    | 29332     | 66825     |
| 54                           | 96    | 84646     | 2.00592   | 47                           | 101   | 09794     | 21658     | 54                           | 97    | 52685     | 1.22619   | 47                           | 100   | 16884     | 37493     |
| 55                           | 97    | 49896     | 1.15946   | 48                           | 102   | 05581     | 11864     | 55                           | 98    | 30447     | 69934     | 48                           | 101   | 09325     | 20609     |
| 56                           | 98    | 28803     | 66050     | 49                           | 103   | 03160     | 06283     | 56                           | 99    | 17520     | 39487     | 49                           | 102   | 05311     | 11284     |
| 57                           | 99    | 16555     | 37247     | 50                           | 104   | 01816     | 03123     | 57                           | 100   | 10002     | 21967     | 50                           | 103   | 03005     | 05973     |
| 58                           | 100   | 09438     | 20692     | 51                           | 105   | 01001     | 01307     | 58                           | 101   | 05475     | 11965     | 51                           | 104   | 01726     | 02968     |
| 59                           | 101   | 05159     | 11254     | 52                           | 106   | 00306     | 00306     | 59                           | 102   | 03087     | 06490     | 52                           | 105   | 00951     | 01242     |
| 60                           | 102   | 02904     | 06095     |                              |       |           |           | 60                           | 103   | 01728     | 03403     | 53                           | 106   | 00291     | 00291     |

54 YEARS.

53 YEARS.



TABLE 14—(continued).

England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.

| DIFFERENCE OF AGE, 44 YEARS. |       |           |           |                              |       |           |           | DIFFERENCE OF AGE, 45 YEARS. |       |           |           |                              |       |           |           |
|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|------------------------------|-------|-----------|-----------|
| Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |       | $D_{x,y}$ | $N_{x,y}$ |
| $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           | $x$ .                        | $y$ . |           |           |
| 10                           | 54    | 7090.3    | 67120.6   | 61                           | 105   | .00569    | .00741    | 10                           | 55    | 6714.9    | 62556.8   | 61                           | 106   | .00183    | .00183    |
| 11                           | 55    | 6440.2    | 60030.3   | 62                           | 106   | .00172    | .00172    | 11                           | 56    | 6092.4    | 55841.9   | DIFFERENCE OF AGE, 51 YEARS. |       |           |           |
| 12                           | 56    | 5848.4    | 53590.1   | DIFFERENCE OF AGE, 52 YEARS. |       |           |           | 12                           | 57    | 5526.1    | 49749.5   |                              |       |           |           |
| 13                           | 57    | 5308.4    | 47741.7   |                              |       |           |           | 13                           | 58    | 5009.0    | 44223.4   |                              |       |           |           |
| 14                           | 58    | 4813.9    | 42433.3   |                              |       |           |           | 14                           | 59    | 4536.1    | 39214.4   |                              |       |           |           |
| 15                           | 59    | 4360.2    | 37619.4   |                              |       |           |           | 15                           | 60    | 4102.0    | 34678.3   | 10                           | 61    | 4715.5    | 39161.7   |
| 16                           | 60    | 3942.6    | 33259.2   | 10                           | 62    | 4420.1    | 35887.0   | 16                           | 61    | 3702.8    | 30576.3   | 11                           | 62    | 4239.3    | 34446.2   |
| 17                           | 61    | 3557.4    | 29316.6   | 11                           | 63    | 3965.4    | 31466.9   | 17                           | 62    | 3334.6    | 26873.5   | 12                           | 63    | 3806.5    | 30206.9   |
| 18                           | 62    | 3202.2    | 25759.2   | 12                           | 64    | 3552.1    | 27501.5   | 18                           | 63    | 2995.3    | 23538.9   | 13                           | 64    | 3412.3    | 26400.4   |
| 19                           | 63    | 2875.2    | 22557.0   | 13                           | 65    | 3176.1    | 23949.4   | 19                           | 64    | 2683.0    | 20543.6   | 14                           | 65    | 3052.4    | 22988.1   |
| 20                           | 64    | 2574.3    | 19681.8   | 14                           | 66    | 2832.9    | 20773.3   | 20                           | 65    | 2396.1    | 17860.6   | 15                           | 66    | 2723.0    | 19935.7   |
| 21                           | 65    | 2298.3    | 17107.5   | 15                           | 67    | 2519.6    | 17940.4   | 21                           | 66    | 2133.0    | 15464.5   | 16                           | 67    | 2421.7    | 17212.7   |
| 22                           | 66    | 2045.2    | 14809.2   | 16                           | 68    | 2233.2    | 15420.8   | 22                           | 67    | 1892.5    | 13331.5   | 17                           | 68    | 2145.5    | 14791.0   |
| 23                           | 67    | 1814.1    | 12764.0   | 17                           | 69    | 1971.5    | 13187.6   | 23                           | 68    | 1672.9    | 11439.0   | 18                           | 69    | 1893.3    | 12645.5   |
| 24                           | 68    | 1603.2    | 10949.9   | 18                           | 70    | 1732.8    | 11216.1   | 24                           | 69    | 1473.1    | 9766.07   | 19                           | 70    | 1663.3    | 10752.2   |
| 25                           | 69    | 1411.2    | 9346.69   | 19                           | 71    | 1515.7    | 9483.31   | 25                           | 70    | 1291.5    | 8292.97   | 20                           | 71    | 1455.3    | 9088.94   |
| 26                           | 70    | 1236.8    | 7935.49   | 20                           | 72    | 1318.8    | 7967.61   | 26                           | 71    | 1127.2    | 7001.47   | 21                           | 72    | 1265.0    | 7633.64   |
| 27                           | 71    | 1079.2    | 6698.69   | 21                           | 73    | 1141.1    | 6648.81   | 27                           | 72    | 978.65    | 5874.27   | 22                           | 73    | 1094.2    | 6368.64   |
| 28                           | 72    | 936.82    | 5619.49   | 22                           | 74    | 981.13    | 5507.71   | 28                           | 73    | 845.09    | 4895.62   | 23                           | 74    | 940.48    | 5274.44   |
| 29                           | 73    | 808.82    | 4682.67   | 23                           | 75    | 838.01    | 4526.58   | 29                           | 74    | 725.27    | 4050.53   | 24                           | 75    | 803.04    | 4333.96   |
| 30                           | 74    | 694.06    | 3873.85   | 24                           | 76    | 710.33    | 3688.57   | 30                           | 75    | 618.44    | 3325.26   | 25                           | 76    | 680.46    | 3530.92   |
| 31                           | 75    | 591.75    | 3179.79   | 25                           | 77    | 597.19    | 2978.24   | 31                           | 76    | 523.43    | 2706.82   | 26                           | 77    | 571.92    | 2850.46   |
| 32                           | 76    | 500.77    | 2588.04   | 26                           | 78    | 497.38    | 2381.05   | 32                           | 77    | 439.49    | 2183.39   | 27                           | 78    | 476.22    | 2278.54   |
| 33                           | 77    | 420.42    | 2087.27   | 27                           | 79    | 410.10    | 1883.67   | 33                           | 78    | 365.63    | 1743.90   | 28                           | 79    | 392.57    | 1802.32   |
| 34                           | 78    | 349.71    | 1666.85   | 28                           | 80    | 334.35    | 1473.57   | 34                           | 79    | 301.15    | 1378.27   | 29                           | 80    | 320.00    | 1409.75   |
| 35                           | 79    | 287.99    | 1317.14   | 29                           | 81    | 269.48    | 1139.22   | 35                           | 80    | 245.28    | 1077.12   | 30                           | 81    | 257.88    | 1089.75   |
| 36                           | 80    | 234.53    | 1029.15   | 30                           | 82    | 214.46    | 869.741   | 36                           | 81    | 197.50    | 831.839   | 31                           | 82    | 205.22    | 831.874   |
| 37                           | 81    | 188.80    | 794.618   | 31                           | 83    | 168.52    | 655.281   | 37                           | 82    | 157.02    | 634.339   | 32                           | 83    | 161.22    | 626.654   |
| 38                           | 82    | 150.08    | 605.818   | 32                           | 84    | 130.61    | 486.761   | 38                           | 83    | 123.24    | 477.319   | 33                           | 84    | 124.94    | 465.434   |
| 39                           | 83    | 117.78    | 455.738   | 33                           | 85    | 99.769    | 356.151   | 39                           | 84    | 95.400    | 354.079   | 34                           | 85    | 95.425    | 340.494   |
| 40                           | 84    | 91.134    | 337.958   | 34                           | 86    | 74.982    | 256.382   | 40                           | 85    | 72.774    | 258.679   | 35                           | 86    | 71.706    | 245.069   |
| 41                           | 85    | 69.501    | 246.824   | 35                           | 87    | 55.394    | 181.400   | 41                           | 86    | 54.612    | 185.905   | 36                           | 87    | 52.965    | 173.363   |
| 42                           | 86    | 52.138    | 177.323   | 36                           | 88    | 40.057    | 126.006   | 42                           | 87    | 40.277    | 131.293   | 37                           | 88    | 38.293    | 120.398   |
| 43                           | 87    | 38.439    | 125.185   | 37                           | 89    | 28.470    | 85.9493   | 43                           | 88    | 29.071    | 91.0163   | 38                           | 89    | 27.211    | 82.1053   |
| 44                           | 88    | 27.733    | 86.7457   | 38                           | 90    | 19.810    | 57.4793   | 44                           | 89    | 20.620    | 61.9453   | 39                           | 90    | 18.929    | 54.8943   |
| 45                           | 89    | 19.662    | 59.0127   | 39                           | 91    | 13.489    | 37.6693   | 45                           | 90    | 14.314    | 41.3253   | 40                           | 91    | 12.886    | 35.9653   |
| 46                           | 90    | 13.643    | 39.3507   | 40                           | 92    | 8.9822    | 24.1803   | 46                           | 91    | 9.7220    | 27.0113   | 41                           | 92    | 8.5782    | 23.0793   |
| 47                           | 91    | 9.2620    | 25.7077   | 41                           | 93    | 5.8399    | 15.1981   | 47                           | 92    | 6.4562    | 17.2893   | 42                           | 93    | 5.5754    | 14.5011   |
| 48                           | 92    | 6.1474    | 16.4457   | 42                           | 94    | 3.7107    | 9.35820   | 48                           | 93    | 4.1851    | 10.8331   | 43                           | 94    | 3.5414    | 8.92566   |
| 49                           | 93    | 3.9828    | 10.2983   | 43                           | 95    | 2.3031    | 5.64750   | 49                           | 94    | 2.6507    | 6.64797   | 44                           | 95    | 2.1972    | 5.38426   |
| 50                           | 94    | 2.5210    | 6.31550   | 44                           | 96    | 1.3969    | 3.34440   | 50                           | 95    | 1.6396    | 3.99727   | 45                           | 96    | 1.3321    | 3.18706   |
| 51                           | 95    | 1.5583    | 3.79450   | 45                           | 97    | .82910    | 1.94750   | 51                           | 96    | .99085    | 2.35767   | 46                           | 97    | .79024    | 1.85496   |
| 52                           | 96    | .94092    | 2.23620   | 46                           | 98    | .48221    | 1.11840   | 52                           | 97    | .58565    | 1.36682   | 47                           | 98    | .45940    | 1.06472   |
| 53                           | 97    | .55573    | 1.29528   | 47                           | 99    | .27944    | .63619    | 53                           | 98    | .33911    | .78117    | 48                           | 99    | .26608    | .60532    |
| 54                           | 98    | .32149    | .73955    | 48                           | 100   | .16077    | .35675    | 54                           | 99    | .19556    | .44206    | 49                           | 100   | .15300    | .33924    |
| 55                           | 99    | .18520    | .41806    | 49                           | 101   | .08874    | .19598    | 55                           | 100   | .11190    | .24650    | 50                           | 101   | .08440    | .18624    |
| 56                           | 100   | .10586    | .23286    | 50                           | 102   | .05051    | .10724    | 56                           | 101   | .06140    | .13460    | 51                           | 102   | .04801    | .10184    |
| 57                           | 101   | .05802    | .12700    | 51                           | 103   | .02856    | .05673    | 57                           | 102   | .03472    | .07320    | 52                           | 103   | .02712    | .05383    |
| 58                           | 102   | .03276    | .06898    | 52                           | 104   | .01639    | .02817    | 58                           | 103   | .01949    | .03848    | 53                           | 104   | .01555    | .02671    |
| 59                           | 103   | .01837    | .03622    | 53                           | 105   | .00902    | .01178    | 59                           | 104   | .01110    | .01899    | 54                           | 105   | .00855    | .01116    |
| 60                           | 104   | .01044    | .01785    | 54                           | 106   | .00276    | .00276    | 60                           | 105   | .00606    | .00789    | 55                           | 106   | .00261    | .00261    |

52 YEARS.

51 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 46 YEARS. |     |                  |                  |                              |     |                  |                  | DIFFERENCE OF AGE, 47 YEARS. |     |                  |                  |                              |     |                  |                  |
|------------------------------|-----|------------------|------------------|------------------------------|-----|------------------|------------------|------------------------------|-----|------------------|------------------|------------------------------|-----|------------------|------------------|
| Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> | Ages.                        |     | D <sub>x,y</sub> | N <sub>x,y</sub> |
| x.                           | y.  |                  |                  | x.                           | y.  |                  |                  | x.                           | y.  |                  |                  | x.                           | y.  |                  |                  |
| 10                           | 56  | 6352.3           | 58190.4          | DIFFERENCE OF AGE, 50 YEARS. |     |                  |                  | 10                           | 57  | 6002.2           | 54016.7          | DIFFERENCE OF AGE, 49 YEARS. |     |                  |                  |
| 11                           | 57  | 5756.6           | 51838.1          |                              |     |                  |                  | 11                           | 58  | 5431.9           | 48014.5          |                              |     |                  |                  |
| 12                           | 58  | 5214.4           | 46081.5          |                              |     |                  |                  | 12                           | 59  | 4913.5           | 42582.6          |                              |     |                  |                  |
| 13                           | 59  | 4719.9           | 40867.1          |                              |     |                  |                  | 13                           | 60  | 4440.5           | 37669.1          |                              |     |                  |                  |
| 14                           | 60  | 4267.5           | 36147.2          |                              |     |                  |                  | 14                           | 61  | 4008.1           | 33228.6          |                              |     |                  |                  |
| 15                           | 61  | 3852.6           | 31879.7          | 10                           | 60  | 5020.8           | 42606.7          | 15                           | 62  | 3611.3           | 29220.5          | 10                           | 59  | 5336.8           | 46228.9          |
| 16                           | 62  | 3470.9           | 28027.1          | 11                           | 61  | 4522.6           | 37585.9          | 16                           | 63  | 3246.6           | 25609.2          | 11                           | 60  | 4815.4           | 40892.1          |
| 17                           | 63  | 3119.1           | 24556.2          | 12                           | 62  | 4069.5           | 33063.3          | 17                           | 64  | 2910.6           | 22362.6          | 12                           | 61  | 4341.4           | 36076.7          |
| 18                           | 64  | 2795.1           | 21437.1          | 13                           | 63  | 3656.7           | 28993.8          | 18                           | 65  | 2601.6           | 19452.0          | 13                           | 62  | 3909.2           | 31735.3          |
| 19                           | 65  | 2497.3           | 18642.0          | 14                           | 64  | 3279.3           | 25337.1          | 19                           | 66  | 2317.7           | 16850.4          | 14                           | 63  | 3514.2           | 27826.1          |
| 20                           | 66  | 2223.8           | 16144.7          | 15                           | 65  | 2934.0           | 22057.8          | 20                           | 67  | 2057.7           | 14532.7          | 15                           | 64  | 3152.2           | 24311.9          |
| 21                           | 67  | 1973.7           | 13920.9          | 16                           | 66  | 2617.1           | 19123.8          | 21                           | 68  | 1820.1           | 12475.0          | 16                           | 65  | 2819.9           | 21159.7          |
| 22                           | 68  | 1745.2           | 11947.2          | 17                           | 67  | 2326.6           | 16506.7          | 22                           | 69  | 1603.7           | 10654.9          | 17                           | 66  | 2514.4           | 18339.8          |
| 23                           | 69  | 1537.2           | 10202.0          | 18                           | 68  | 2060.4           | 14180.1          | 23                           | 70  | 1406.9           | 9051.20          | 18                           | 67  | 2234.2           | 15825.4          |
| 24                           | 70  | 1348.2           | 8664.84          | 19                           | 69  | 1817.3           | 12119.7          | 24                           | 71  | 1228.6           | 7644.30          | 19                           | 68  | 1977.7           | 13591.2          |
| 25                           | 71  | 1177.0           | 7316.64          | 20                           | 70  | 1595.9           | 10302.4          | 25                           | 72  | 1067.3           | 6415.70          | 20                           | 69  | 1743.7           | 11613.5          |
| 26                           | 72  | 1022.1           | 6139.64          | 21                           | 71  | 1394.9           | 8706.47          | 26                           | 73  | 922.06           | 5348.40          | 21                           | 70  | 1530.7           | 9869.84          |
| 27                           | 73  | 882.83           | 5117.54          | 22                           | 72  | 1212.9           | 7311.57          | 27                           | 74  | 791.63           | 4426.34          | 22                           | 71  | 1337.5           | 8339.14          |
| 28                           | 74  | 757.79           | 4234.71          | 23                           | 73  | 1048.8           | 6098.67          | 28                           | 75  | 675.23           | 3634.71          | 23                           | 72  | 1162.7           | 7001.64          |
| 29                           | 75  | 646.25           | 3476.92          | 24                           | 74  | 901.23           | 5049.87          | 29                           | 76  | 571.64           | 2959.48          | 24                           | 73  | 1005.1           | 5838.94          |
| 30                           | 76  | 547.04           | 2830.67          | 25                           | 75  | 769.28           | 4148.64          | 30                           | 77  | 480.09           | 2387.84          | 25                           | 74  | 863.34           | 4833.84          |
| 31                           | 77  | 459.37           | 2283.63          | 26                           | 76  | 651.67           | 3379.36          | 31                           | 78  | 399.51           | 1907.75          | 26                           | 75  | 736.73           | 3970.50          |
| 32                           | 78  | 382.21           | 1824.26          | 27                           | 77  | 547.59           | 2727.69          | 32                           | 79  | 329.14           | 1508.24          | 27                           | 76  | 623.94           | 3233.77          |
| 33                           | 79  | 314.96           | 1442.05          | 28                           | 78  | 455.87           | 2180.10          | 33                           | 80  | 268.17           | 1179.10          | 28                           | 77  | 524.18           | 2609.83          |
| 34                           | 80  | 256.49           | 1127.09          | 29                           | 79  | 375.72           | 1724.23          | 34                           | 81  | 215.99           | 910.931          | 29                           | 78  | 436.38           | 2085.65          |
| 35                           | 81  | 206.56           | 870.601          | 30                           | 80  | 306.23           | 1348.51          | 35                           | 82  | 171.79           | 694.941          | 30                           | 79  | 359.55           | 1649.27          |
| 36                           | 82  | 164.26           | 664.041          | 31                           | 81  | 246.75           | 1042.28          | 36                           | 83  | 134.88           | 523.151          | 31                           | 80  | 293.02           | 1289.72          |
| 37                           | 83  | 128.94           | 499.781          | 32                           | 82  | 196.34           | 795.531          | 37                           | 84  | 104.45           | 388.271          | 32                           | 81  | 236.07           | 996.701          |
| 38                           | 84  | 99.837           | 370.841          | 33                           | 83  | 154.23           | 599.191          | 38                           | 85  | 79.724           | 283.821          | 33                           | 82  | 187.82           | 760.631          |
| 39                           | 85  | 76.180           | 271.004          | 34                           | 84  | 119.50           | 444.961          | 39                           | 86  | 59.860           | 204.097          | 34                           | 83  | 147.51           | 572.811          |
| 40                           | 86  | 57.184           | 194.824          | 35                           | 85  | 91.256           | 325.461          | 40                           | 87  | 44.175           | 144.237          | 35                           | 84  | 114.28           | 425.301          |
| 41                           | 87  | 42.189           | 137.640          | 36                           | 86  | 68.562           | 234.205          | 41                           | 88  | 31.907           | 100.062          | 36                           | 85  | 87.254           | 311.021          |
| 42                           | 88  | 30.461           | 95.4508          | 37                           | 87  | 50.633           | 165.643          | 42                           | 89  | 22.648           | 68.1552          | 37                           | 86  | 65.543           | 223.767          |
| 43                           | 89  | 21.614           | 64.9898          | 38                           | 88  | 36.600           | 115.010          | 43                           | 90  | 15.735           | 45.5072          | 38                           | 87  | 48.394           | 158.224          |
| 44                           | 90  | 15.011           | 43.3758          | 39                           | 89  | 26.002           | 78.4105          | 44                           | 91  | 10.697           | 29.7722          | 39                           | 88  | 34.973           | 109.830          |
| 45                           | 91  | 10.200           | 28.3648          | 40                           | 90  | 18.083           | 52.4085          | 45                           | 92  | 7.1101           | 19.0752          | 40                           | 89  | 24.839           | 74.8572          |
| 46                           | 92  | 6.7768           | 18.1648          | 41                           | 91  | 12.306           | 34.3255          | 46                           | 93  | 4.6136           | 11.9651          | 41                           | 90  | 17.269           | 50.0182          |
| 47                           | 93  | 4.3953           | 11.3880          | 42                           | 92  | 8.1896           | 22.0199          | 47                           | 94  | 2.9253           | 7.35154          | 42                           | 91  | 11.749           | 32.7492          |
| 48                           | 94  | 2.7854           | 6.99266          | 43                           | 93  | 5.3209           | 13.8299          | 48                           | 95  | 1.8125           | 4.42624          | 43                           | 92  | 7.8158           | 21.0002          |
| 49                           | 95  | 1.7239           | 4.20726          | 44                           | 94  | 3.3784           | 8.50897          | 49                           | 96  | 1.0960           | 2.61374          | 44                           | 93  | 5.0761           | 13.1844          |
| 50                           | 96  | 1.0424           | 2.48336          | 45                           | 95  | 2.0951           | 5.13057          | 50                           | 97  | 6.4881           | 1.51774          | 45                           | 94  | 3.2216           | 8.10826          |
| 51                           | 97  | .61666           | 1.44096          | 46                           | 96  | 1.2696           | 3.03547          | 51                           | 98  | .37629           | .86893           | 46                           | 95  | 1.9970           | 4.88666          |
| 52                           | 98  | .35737           | .82430           | 47                           | 97  | .75285           | 1.76587          | 52                           | 99  | .21738           | .49264           | 47                           | 96  | 1.2096           | 2.88966          |
| 53                           | 99  | .20628           | .46693           | 48                           | 98  | .43743           | 1.01302          | 53                           | 100 | .12463           | .27526           | 48                           | 97  | .71685           | 1.68006          |
| 54                           | 100 | .11816           | .26065           | 49                           | 99  | .25322           | .57559           | 54                           | 101 | .06854           | .15063           | 49                           | 98  | .41628           | .96321           |
| 55                           | 101 | .06491           | .14249           | 50                           | 100 | .14551           | .32237           | 55                           | 102 | .03885           | .08209           | 50                           | 99  | .24083           | .54693           |
| 56                           | 102 | .03675           | .07758           | 51                           | 101 | .08022           | .17686           | 56                           | 103 | .02186           | .04324           | 51                           | 100 | .13830           | .30610           |
| 57                           | 103 | .02066           | .04083           | 52                           | 102 | .04559           | .09664           | 57                           | 104 | .01248           | .02138           | 52                           | 101 | .07619           | .16780           |
| 58                           | 104 | .01178           | .02017           | 53                           | 103 | .02574           | .05105           | 58                           | 105 | .00683           | .00890           | 53                           | 102 | .04326           | .09161           |
| 59                           | 105 | .00644           | .00839           | 54                           | 104 | .01474           | .02531           | 59                           | 106 | .00207           | .00207           | 54                           | 103 | .02440           | .04835           |
| 60                           | 106 | .00195           | .00195           | 55                           | 105 | .00810           | .01057           |                              |     |                  |                  | 55                           | 104 | .01396           | .02395           |
|                              |     |                  |                  | 56                           | 106 | .00247           | .00247           |                              |     |                  |                  | 56                           | 105 | .00766           | .00999           |
|                              |     |                  |                  |                              |     |                  |                  |                              |     |                  |                  | 57                           | 106 | .00233           | .00233           |

50 YEARS.

7 G

49 YEARS.



TABLE 14—(continued).

*England and Wales.—Whole Population.—Joint Lives.—Males.—Seven per Cent.*

| DIFFERENCE OF AGE, 48 YEARS. |      |           |           |       |      |           |           | DIFFERENCE OF AGE, 48 YEARS. |      |           |           |       |      |           |           |
|------------------------------|------|-----------|-----------|-------|------|-----------|-----------|------------------------------|------|-----------|-----------|-------|------|-----------|-----------|
| Ages.                        |      | $D_{x,y}$ | $N_{x,y}$ | Ages. |      | $D_{x,y}$ | $N_{x,y}$ | Ages.                        |      | $D_{x,y}$ | $N_{x,y}$ | Ages. |      | $D_{x,y}$ | $N_{x,y}$ |
| $x.$                         | $y.$ |           |           | $x.$  | $y.$ |           |           | $x.$                         | $y.$ |           |           | $x.$  | $y.$ |           |           |
| 10                           | 58   | 5663.6    | 50030.9   | 23    | 71   | 1282.1    | 7984.98   | 35                           | 83   | 141.07    | 547.491   | 47    | 95   | 1.9025    | 4.65160   |
| 11                           | 59   | 5118.4    | 44367.3   | 24    | 72   | 1114.1    | 6702.88   | 36                           | 84   | 109.27    | 406.421   | 48    | 96   | 1.1517    | 2.74910   |
| 12                           | 60   | 4622.6    | 39248.9   | 25    | 73   | 962.80    | 5588.78   | 37                           | 85   | 83.413    | 297.151   | 49    | 97   | .68219    | 1.59740   |
| 13                           | 61   | 4170.5    | 34626.3   | 26    | 74   | 826.81    | 4625.98   | 38                           | 86   | 62.645    | 213.738   | 50    | 98   | .39591    | .91521    |
| 14                           | 62   | 3757.0    | 30455.8   | 27    | 75   | 705.38    | 3799.17   | 39                           | 87   | 46.243    | 151.093   | 51    | 99   | .22889    | .51930    |
| 15                           | 63   | 3378.0    | 26698.8   | 28    | 76   | 597.27    | 3093.79   | 40                           | 88   | 33.409    | 104.850   | 52    | 100  | .13134    | .29041    |
| 16                           | 64   | 3029.6    | 23320.8   | 29    | 77   | 501.68    | 2496.52   | 41                           | 89   | 23.722    | 71.4408   | 53    | 101  | .07229    | .15907    |
| 17                           | 65   | 2709.2    | 20291.2   | 30    | 78   | 417.52    | 1994.84   | 42                           | 90   | 16.487    | 47.7188   | 54    | 102  | .04102    | .08678    |
| 18                           | 66   | 2414.6    | 17582.0   | 31    | 79   | 344.03    | 1577.32   | 43                           | 91   | 11.213    | 31.2318   | 55    | 103  | .02311    | .04576    |
| 19                           | 67   | 2144.6    | 15167.4   | 32    | 80   | 280.33    | 1233.29   | 44                           | 92   | 7.4562    | 20.0188   | 56    | 104  | .01321    | .02265    |
| 20                           | 68   | 1897.6    | 13022.8   | 33    | 81   | 225.83    | 952.961   | 45                           | 93   | 4.8404    | 12.5626   | 57    | 105  | .00724    | .00944    |
| 21                           | 69   | 1672.5    | 11125.2   | 34    | 82   | 179.64    | 727.131   | 46                           | 94   | 3.0706    | 7.72220   | 58    | 106  | .00220    | .00220    |
| 22                           | 70   | 1467.7    | 9452.68   |       |      |           |           |                              |      |           |           |       |      |           |           |

It has already been said, that in the continuous method of constructing auxiliary Tables there is a necessity for the logarithms being carried to more decimal places than by the direct process; but generally seven places will ensure accuracy, provided care be taken in the determination of  $\lambda.v$ , and this may be done with complete accuracy to as many places as are required by the following formula:—

According to the logarithmic theorem

$$\text{Log. } (1+k) = m_1 k + m_2 k^2 + m_3 k^3 + m_4 k^4 + m_5 k^5 + \&c. = (A).$$

If in the first member of this equation  $k=0$  then  $\lambda.(1+k) = \lambda.1$  and the expansion will not contain any term independent of  $k$ .

If  $k$  be converted into  $k+z$ , then

$$\lambda.(1+k+z) = m_1(k+z) + m_2(k+z)^2 + m_3(k+z)^3 + \&c. = (B).$$

$$\text{But } 1+k+z = (1+k) \cdot \left(1 + \frac{1}{1+k} z\right), \text{ therefore}$$

$$\lambda.(1+k+z) = \lambda.(1+k) + \lambda \cdot \left(1 + \frac{1}{1+k} z\right)$$

Hence by equation (A)

$$\lambda.(1+k+z) = m_1 k + m_2 k^2 + \&c. + m_1 \frac{1}{1+k} z + m_2 \left(\frac{1}{1+k}\right)^2 z^2 + \&c. = (C).$$



The second member of this equation must be equal to the second member of equation (B), and by applying the binomial theorem the complete co-efficient of  $z$  in (B) is evidently

$$m_1 + 2 m_2 k + 3 m_3 k^2 + 4 m_4 k^3 + \&c.$$

This must correspond with the complete co-efficient of  $z$  in equation (C) which is

$$m_1 \frac{1}{1+k} = m_1 - m_1 k + m_1 k^2 - m_1 k^3 + \&c.$$

In equation (C) the terms beyond this contain only the higher powers of  $z$ , and these two expressions being the same it therefore follows that

$$m_1 = m_1$$

$$2 m_2 = -m_1 \text{ and therefore } m_2 = -\frac{1}{2} m_1$$

$$3 m_3 = +m_1 \quad \dots \quad m_3 = +\frac{1}{3} m_1$$

$$4 m_4 = -m_1 \quad \dots \quad m_4 = -\frac{1}{4} m_1$$

$$5 m_5 = +m_1 \quad \dots \quad m_5 = +\frac{1}{5} m_1$$

$$6 m_6 = -m_1 \quad \dots \quad m_6 = -\frac{1}{6} m_1$$

$$\&c. \quad + \&c. \quad \dots \quad \&c. \quad + \&c. \text{ consequently}$$

$$\lambda.(1+k) = m_1 \left( k - \frac{k^2}{2} + \frac{k^3}{3} - \frac{k^4}{4} + \frac{k^5}{5} - \frac{k^6}{6} + \&c. \right)$$

and which produces the logarithm of  $1+k$ ; but the symbol  $m_1$  employed above being the modulus of the system of logarithms, the results of the last equation will give either common or Napierian logarithms according as

$$m_1 = 1 = \text{modulus of the Napierian system, or}$$

$$m_1 = \frac{\text{Com. } \lambda.10}{\text{Nap. } \lambda.10} = \frac{1}{2.3025851} = .434294481903 = \text{modulus of ordinary logarithms.}$$

Hence in the Napierian system

$$\text{Log.}_e (1+k) = k - \frac{k^2}{2} + \frac{k^3}{3} - \frac{k^4}{4} + \frac{k^5}{5} - \frac{k^6}{6} + \frac{k^7}{7} - \frac{k^8}{8} + \dots$$

This series is always true when  $k$  is not greater than 1; it converges slowly when  $k = 1$ , and more rapidly as  $k$  becomes smaller. In the determination of  $\lambda.v$  it will almost always happen that  $k$  is a small fraction, and then the series above given is rapidly convergent.

Ten per cent., for example, is the highest rate of interest entering into the construction of the preceding Tables, and in that case

$$v = \frac{1}{1+r} = \frac{1}{1.1}$$



Hence to find  $\log_e (1.1)$  make  $k = .1$ , then

$$\text{Log}_e (1.1) = .1 - \frac{.01}{2} + \frac{.001}{3} - \frac{.0001}{4} + \frac{.00001}{5} - \frac{.000001}{6} + \dots$$

These terms may be extended as far as necessary and when arranged for summation the following results are obtained:—

$$\begin{array}{rcl}
 & + \left\{ \begin{array}{l} .1 \\ .00033333333333 \\ .00000200000000 \\ .00000001428571 \\ .00000000011111 \\ .00000000000091 \end{array} \right. & \\
 & + .10033534773106 & \\
 & - \left\{ \begin{array}{l} .005 \\ 000025 \\ .00000016666667 \\ .00000000125000 \\ .00000000001000 \\ .00000000000008 \end{array} \right. & \\
 & - .00502516792675 &
 \end{array}$$

$$\text{Whence } \text{Log}_e (1.1) = (.10033534773106 - .00502516792675) = 0.09531017980431.$$

This result, which is the natural or Napierian logarithm, is correct to the thirteenth decimal inclusive, and if multiplied by the modulus .434294481903, will be reduced to the ordinary base. Therefore

$$\lambda.(1+r) = \lambda.(1.1) = (0.09531017980431 \times .434294481903) = 0.041392685158$$

$$\text{and } \lambda.v = \lambda.\left(\frac{1}{1+r}\right) = \lambda.\left(\frac{1}{1.1}\right) = 9.958607314842, \text{ which agrees exactly with the value given in page 532, and also that in Table 15 following.}$$

To find  $\text{Log}_e (1.07)$  make  $k = .07$  and

$$\text{Log}_e (1.07) = .07 - \frac{.0049}{2} + \frac{.000343}{3} - \frac{.00002401}{4} + \frac{.0000016807}{5} - \dots$$

the summation of which produces

$$\begin{array}{rcl}
 & + \left\{ \begin{array}{l} .07 \\ .000114333333 \\ .000000336140 \\ .00000000117649 \\ .00000000000448 \end{array} \right. & \\
 & + .07011467065397 & \\
 & - \left\{ \begin{array}{l} .00245 \\ .0000060025 \\ .00000001960817 \\ .00000000007206 \\ .00000000000028 \end{array} \right. & \\
 & - .00245602218051 &
 \end{array}$$

$$\text{and } \text{Log}_e (1.07) = (.07011467065397 - .00245602218051) = 0.06765864847346$$

consequently

$$\lambda.(1+r) = \lambda.(1.07) = (0.06765864847346 \times .434294481903) = 0.029383777685$$

$$\text{and } \lambda.v = \lambda.\left(\frac{1}{1+r}\right) = \lambda.\left(\frac{1}{1.07}\right) = 9.970616222315.$$

This, it will be seen, has been determined correctly to twelve places of decimals by the employment of ten terms in the above series. If, however, eight terms only had



been employed the result would have been correct for eleven decimal places, and the twelfth place would have been two units only in error, producing 7 instead of 5 as above.

Again, to find  $\text{Log}_e(1.03)$  make  $k = .03$  and

$$\text{Log}_e(1.03) = .03 - \frac{.0009}{2} + \frac{.000027}{3} - \frac{.00000081}{4} + \frac{.0000000243}{5} - \frac{.000000000729}{6} + \dots$$

the summation of which gives

$$\begin{array}{rcl} & + \left\{ \begin{array}{l} .03 \\ .000009 \\ .00000000486 \end{array} \right. & - \left\{ \begin{array}{l} .00045 \\ .0000002025 \\ .00000000012 \end{array} \right. \\ + .03000900486 & & - .00045020262 \quad \text{and} \end{array}$$

$$\text{Log}_e(1.03) = (.03000900486 - .00045020262) = 0.02955880224, \quad \text{and hence}$$

$$\lambda.(1+r) = \lambda.(1.03) = (0.02955880224 \times .434294481903) = 0.012837224705; \quad \text{and therefore}$$

$$\lambda.v = \lambda.\left(\frac{1}{1+r}\right) = \lambda.\left(\frac{1}{1.03}\right) = 9.987162775295,$$

agreeing with the result in page 532, as well as with that in Table 15 following, although the calculation has been limited to six terms of the series only. It is therefore obvious that as the value of the fraction  $k$  diminishes the series becomes rapidly convergent. In the first of the preceding examples where  $k = .1$  the series consisted of twelve terms, but in the last, in which  $k = .03$  it was formed of six terms only, but it in each case gives  $\lambda.v$  correct to twelve places.

Having in this manner found  $\lambda.v$  for each rate of interest specified in page 532, the following Table, containing the logarithms to twelve places of decimals, of the present value of £1 due at the end of any number of years from one to 110 years, has been calculated for ten different rates of interest. As this Table is of extensive application in all matters connected with life contingencies every care has been taken to ensure its accuracy. It has been calculated in duplicate by the following formula, and as a further check on the results so obtained a third calculation was made by a different formula.

It will have been observed that  $\lambda.v$  is simply the arithmetical complement of  $\lambda.(1+r)$ . These two values having, as already stated, been found for each rate of interest by the logarithmic formula given above, it will be seen that in the next Table

$$\lambda.v^x = \lambda.\frac{1}{(1+r)^x} = \lambda.\frac{1}{(1+r)^{x-1}} - \lambda.(1+r) \quad \text{or}$$

$$\lambda.v^{x-1} = \lambda.v^x + \lambda.(1+r);$$

But  $\lambda.(1+r)$  being constant its continuous addition to the initial  $\lambda.v$  will produce the successive values in the different columns of the following Table:—



*Log. of the Present Value of £.1, due at the end of any number of Years.*

| YEARS. | 3 PER CENT. |       | 3½ PER CENT. |       | 4 PER CENT. |       | 4½ PER CENT. |       | 5 PER CENT. |       |
|--------|-------------|-------|--------------|-------|-------------|-------|--------------|-------|-------------|-------|
| 1      | 9.9871627   | 75295 | 9.9850596    | 50207 | 9.9829666   | 60701 | 9.9808837    | 09553 | 9.9788107   | 00930 |
| 2      | .9743255    | 50590 | .9701193     | 00414 | .9659333    | 21402 | .9617674     | 19106 | .9576214    | 01860 |
| 3      | .9614883    | 25885 | .9551789     | 50621 | .9488999    | 82103 | .9426511     | 28659 | .9364321    | 02790 |
| 4      | .9486511    | 01180 | .9402386     | 00828 | .9318666    | 42804 | .9235348     | 38212 | .9152428    | 03720 |
| 5      | .9358138    | 76475 | .9252982     | 51035 | .9148333    | 03505 | .9044185     | 47765 | .8940535    | 04650 |
| 6      | .9229766    | 51770 | .9103579     | 01242 | .8977999    | 64206 | .8853022     | 57318 | .8728642    | 05580 |
| 7      | .9101394    | 27065 | .8954175     | 51449 | .8807666    | 24907 | .8661859     | 66871 | .8516749    | 06510 |
| 8      | .8973022    | 02360 | .8804772     | 01656 | .8637332    | 85608 | .8470696     | 76424 | .8304856    | 07440 |
| 9      | .8844649    | 77655 | .8655368     | 51863 | .8466999    | 46309 | .8279533     | 85977 | .8092963    | 08370 |
| 10     | .8716277    | 52950 | .8505965     | 02070 | .8296666    | 07010 | .8088370     | 95530 | .7881070    | 09300 |
| 11     | .8587905    | 28245 | .8356561     | 52277 | .8126332    | 67711 | .7897208     | 05083 | .7669177    | 10230 |
| 12     | .8459533    | 03540 | .8207158     | 02484 | .7955999    | 28412 | .7706045     | 14636 | .7457284    | 11160 |
| 13     | .8331160    | 78835 | .8057754     | 52691 | .7785665    | 89113 | .7514882     | 24189 | .7245391    | 12090 |
| 14     | .8202788    | 54130 | .7908351     | 02898 | .7615332    | 49814 | .7323719     | 33742 | .7033498    | 13020 |
| 15     | .8074416    | 29425 | .7758947     | 53105 | .7444999    | 10515 | .7132556     | 43295 | .6821605    | 13950 |
| 16     | .7946044    | 04720 | .7609544     | 03312 | .7274665    | 71216 | .6941393     | 52848 | .6609712    | 14880 |
| 17     | .7817671    | 80015 | .7460140     | 53519 | .7104332    | 31917 | .6750230     | 62401 | .6397819    | 15810 |
| 18     | .7689299    | 55310 | .7310737     | 03726 | .6933998    | 92618 | .6559067     | 71954 | .6185926    | 16740 |
| 19     | .7560927    | 30605 | .7161333     | 53933 | .6763665    | 53319 | .6367904     | 81507 | .5974033    | 17670 |
| 20     | .7432555    | 05900 | .7011930     | 04140 | .6593332    | 14020 | .6176741     | 91060 | .5762140    | 18600 |
| 21     | .7304182    | 81195 | .6862526     | 54347 | .6422998    | 74721 | .5985579     | 00613 | .5550247    | 19530 |
| 22     | .7175810    | 56490 | .6713123     | 04554 | .6252665    | 35422 | .5794416     | 10166 | .5338354    | 20460 |
| 23     | .7047438    | 31785 | .6563719     | 54761 | .6082331    | 96123 | .5603253     | 19719 | .5126461    | 21390 |
| 24     | .6919066    | 07080 | .6414316     | 04968 | .5911998    | 56824 | .5412090     | 29272 | .4914568    | 22320 |
| 25     | .6790693    | 82375 | .6264912     | 55175 | .5741665    | 17525 | .5220927     | 38825 | .4702675    | 23250 |
| 26     | .6662321    | 57670 | .6115509     | 05382 | .5571331    | 78226 | .5029764     | 48378 | .4490782    | 24180 |
| 27     | .6533949    | 32965 | .5966105     | 55589 | .5400998    | 38927 | .4838601     | 57931 | .4278889    | 25110 |
| 28     | .6405577    | 08260 | .5816702     | 05796 | .5230664    | 99628 | .4647438     | 67484 | .4066996    | 26040 |
| 29     | .6277204    | 83555 | .5667298     | 56003 | .5060331    | 60329 | .4456275     | 77037 | .3855103    | 26970 |
| 30     | .6148832    | 58850 | .5517895     | 06210 | .4889998    | 21030 | .4265112     | 86590 | .3643210    | 27900 |
| 31     | .6020460    | 34145 | .5368491     | 56417 | .4719664    | 81731 | .4073949     | 96143 | .3431317    | 28830 |
| 32     | .5892088    | 09440 | .5219088     | 06624 | .4549331    | 42432 | .3882787     | 05696 | .3219424    | 29760 |
| 33     | .5763715    | 84735 | .5069684     | 56831 | .4378998    | 03133 | .3691624     | 15249 | .3007531    | 30690 |
| 34     | .5635343    | 60030 | .4920281     | 07038 | .4208664    | 63834 | .3500461     | 24802 | .2795638    | 31620 |
| 35     | .5506971    | 35325 | .4770877     | 57245 | .4038331    | 24535 | .3309298     | 34355 | .2583745    | 32550 |
| 36     | .5378599    | 10620 | .4621474     | 07452 | .3867997    | 85236 | .3118135     | 43908 | .2371852    | 33480 |
| 37     | .5250226    | 85915 | .4472070     | 57659 | .3697664    | 45937 | .2926972     | 53461 | .2159959    | 34410 |
| 38     | .5121854    | 61210 | .4322667     | 07866 | .3527331    | 06638 | .2735809     | 63014 | .1948066    | 35340 |
| 39     | .4993482    | 36505 | .4173263     | 58073 | .3356997    | 67339 | .2544646     | 72567 | .1736173    | 36270 |
| 40     | .4865110    | 11800 | .4023860     | 08280 | .3186664    | 28040 | .2353483     | 82120 | .1524280    | 37200 |
| 41     | .4736737    | 87095 | .3874456     | 58487 | .3016330    | 88741 | .2162320     | 91673 | .1312387    | 38130 |
| 42     | .4608365    | 62390 | .3725053     | 08694 | .2845997    | 49442 | .1971158     | 01226 | .1100494    | 39060 |
| 43     | .4479993    | 37685 | .3575649     | 58901 | .2675664    | 10143 | .1779995     | 10779 | .0888601    | 39990 |
| 44     | .4351621    | 12980 | .3426246     | 09108 | .2505330    | 70844 | .1588832     | 20332 | .0676708    | 40920 |
| 45     | .4223248    | 88275 | .3276842     | 59315 | .2334997    | 31545 | .1397669     | 29885 | .0464815    | 41850 |
| 46     | .4094876    | 63570 | .3127439     | 09522 | .2164663    | 92246 | .1206506     | 39438 | .0252922    | 42780 |
| 47     | .3966504    | 38865 | .2978035     | 59729 | .1994330    | 52947 | .1015343     | 48991 | .9.0041029  | 43710 |
| 48     | .3838132    | 14160 | .2828632     | 09936 | .1823997    | 13648 | .0824180     | 58544 | .8.9829136  | 44640 |
| 49     | .3709759    | 89455 | .2679228     | 60143 | .1653663    | 74349 | .0633017     | 68097 | .9.9617243  | 45570 |
| 50     | .3581387    | 64750 | .2529825     | 10350 | .1483330    | 35050 | .0441854     | 77650 | .9.9405350  | 46500 |
| 51     | .3453015    | 40045 | .2380421     | 60557 | .1312996    | 95751 | .0250691     | 87203 | .9.9193457  | 47430 |
| 52     | .3324643    | 15340 | .2231018     | 10764 | .11.2663    | 56452 | .9.0059528   | 96756 | .8.9981564  | 48360 |
| 53     | .3196270    | 90635 | .2081614     | 60971 | .0972330    | 17153 | .8.9868366   | 06309 | .8.9769671  | 49290 |
| 54     | .3067898    | 65920 | .1932211     | 11178 | .0801996    | 77854 | .9.9677203   | 15862 | .8.9557778  | 50220 |
| 55     | .2939526    | 41225 | .1782807     | 61385 | .9.0631663  | 38555 | .8.9486040   | 25415 | .8.9345885  | 51150 |



*Log. of the Present Value of £.1, due at the end of any number of Years.*

| YEARS. | 3 PER CENT. |       | 3½ PER CENT. |       | 4 PER CENT. |       | 4½ PER CENT. |       | 5 PER CENT. |       |
|--------|-------------|-------|--------------|-------|-------------|-------|--------------|-------|-------------|-------|
| 56     | 9.2811154   | 16520 | 9.1633404    | 11592 | 9.0461329   | 99256 | 8.9294877    | 34968 | 8.8133992   | 52080 |
| 57     | .2682781    | 91815 | .1484000     | 61799 | .0290996    | 59957 | .9103714     | 44521 | .7922099    | 53010 |
| 58     | .2554409    | 67110 | .1334597     | 12006 | 9.0120663   | 20658 | .8912551     | 54074 | .7710206    | 53940 |
| 59     | .2426037    | 42405 | .1185193     | 62213 | 8.9950329   | 81359 | .8721388     | 63627 | .7498313    | 54870 |
| 60     | .2297665    | 17700 | .1035790     | 12420 | .9779996    | 42060 | .8530225     | 73180 | .7286420    | 55800 |
| 61     | .2169292    | 92995 | .0886386     | 62627 | .9609663    | 02761 | .8333062     | 82733 | .7074527    | 56730 |
| 62     | .2040920    | 68290 | .0736983     | 12834 | .9439329    | 63462 | .8147899     | 92286 | .6862634    | 57660 |
| 63     | .1912548    | 43585 | .0587579     | 63041 | .9268996    | 24163 | .7956737     | 01839 | .6650741    | 58590 |
| 64     | .1784176    | 18880 | .0438176     | 13248 | .9098662    | 84864 | .7765574     | 11392 | .6438848    | 59520 |
| 65     | .1655803    | 94175 | .0288772     | 63455 | .8928329    | 45565 | .7574411     | 20945 | .6226955    | 60450 |
| 66     | .1527431    | 69470 | 9.0139369    | 13662 | .8757996    | 06266 | .7383248     | 30498 | .6015062    | 61380 |
| 67     | .1399059    | 44765 | 8.9989965    | 63869 | .8587662    | 66967 | .7192085     | 40051 | .5803169    | 62310 |
| 68     | .1270687    | 20060 | .9840562     | 14076 | .8417329    | 27668 | .7000922     | 49604 | .5591276    | 63240 |
| 69     | .1142314    | 95355 | .9691158     | 64283 | .8246995    | 88369 | .6809759     | 59175 | .5379383    | 64170 |
| 70     | .1013942    | 70650 | .9541755     | 14490 | .8076662    | 49070 | .6618596     | 68710 | .5167490    | 65100 |
| 71     | .0885570    | 45945 | .9392351     | 64697 | .7906329    | 09771 | .6427433     | 78263 | .4955597    | 66030 |
| 72     | .0757198    | 21240 | .9242948     | 14904 | .7735995    | 70472 | .6236270     | 87816 | .4743704    | 66960 |
| 73     | .0628825    | 96535 | .9093544     | 65111 | .7565662    | 31173 | .6045107     | 97369 | .4531811    | 67890 |
| 74     | .0500453    | 71830 | .8944141     | 15318 | .7395328    | 91874 | .5853945     | 06922 | .4319918    | 68820 |
| 75     | .0372081    | 47125 | .8794737     | 65525 | .7224995    | 52575 | .5662782     | 16475 | .4108025    | 69750 |
| 76     | .0243709    | 22420 | .8645334     | 15732 | .7054662    | 13276 | .5471619     | 26028 | .3896132    | 70680 |
| 77     | 9.0115336   | 97715 | .8495930     | 65939 | .6884328    | 73977 | .5280456     | 35581 | .3684239    | 71610 |
| 78     | 8.9986964   | 73010 | .8346527     | 16146 | .6713995    | 34678 | .5089293     | 45134 | .3472346    | 72540 |
| 79     | .9858592    | 48305 | .8197123     | 66353 | .6543661    | 95379 | .4898130     | 54687 | .3260453    | 73470 |
| 80     | .9730220    | 23600 | .8047720     | 16560 | .6373328    | 56080 | .4706967     | 64240 | .3048560    | 74400 |
| 81     | .9601847    | 98895 | .7898316     | 66767 | .6202995    | 16781 | .4515804     | 73793 | .2836667    | 75330 |
| 82     | .9473475    | 74190 | .7748913     | 16974 | .6032661    | 77482 | .4324641     | 83346 | .2624774    | 76260 |
| 83     | .9345103    | 49485 | .7599509     | 67181 | .5862328    | 38183 | .4133478     | 92899 | .2412881    | 77190 |
| 84     | .9216731    | 24780 | .7450106     | 17388 | .5691994    | 98884 | .3942316     | 02452 | .2200988    | 78120 |
| 85     | .9088359    | 00075 | .7300702     | 67595 | .5521661    | 59585 | .3751153     | 12005 | .1989095    | 79050 |
| 86     | .8959986    | 75370 | .7151299     | 17002 | .5351328    | 20286 | .3559990     | 21558 | .1777202    | 79980 |
| 87     | .8831614    | 50665 | .7001895     | 68009 | .5180994    | 80987 | .3368827     | 31111 | .1565309    | 80910 |
| 88     | .8703242    | 25960 | .6852492     | 18216 | .5010661    | 41688 | .3177664     | 40664 | .1353416    | 81840 |
| 89     | .8574870    | 01255 | .6703088     | 68423 | .4840328    | 02389 | .2986501     | 50217 | .1141523    | 82770 |
| 90     | .8446497    | 76550 | .6553685     | 18630 | .4669994    | 63090 | .2795338     | 59770 | .0929630    | 83700 |
| 91     | .8318125    | 51845 | .6404281     | 68837 | .4499661    | 23791 | .2604175     | 69323 | .0717737    | 84630 |
| 92     | .8189753    | 27140 | .6254878     | 19044 | .4329327    | 84492 | .2413012     | 78876 | .0505844    | 85560 |
| 93     | .8061381    | 02435 | .6105474     | 69251 | .4158994    | 45193 | .2221849     | 88429 | .0293951    | 86490 |
| 94     | .7933008    | 77730 | .5956071     | 19458 | .3988661    | 05894 | .2030686     | 97982 | 8.0082058   | 87420 |
| 95     | .7804636    | 53025 | .5806667     | 69665 | .3818327    | 66595 | .1839524     | 07535 | 7.9870165   | 88350 |
| 96     | .7676264    | 28320 | .5657264     | 19872 | .3647994    | 27296 | .1648361     | 17088 | .9658272    | 89280 |
| 97     | .7547892    | 03615 | .5507860     | 70079 | .3477660    | 87997 | .1457198     | 26641 | .9446379    | 90210 |
| 98     | .7419519    | 78910 | .5358457     | 20286 | .3307327    | 48698 | .1266035     | 36194 | .9234486    | 91140 |
| 99     | .7291147    | 54205 | .5209053     | 70493 | .3136994    | 09399 | .1074872     | 45747 | .9022593    | 92070 |
| 100    | .7162775    | 29500 | .5059650     | 20700 | .2966660    | 70100 | .0883709     | 55300 | .8810700    | 93000 |
| 101    | .7034403    | 04795 | .4910246     | 70907 | .2796327    | 30801 | .0692546     | 64853 | .8598807    | 93930 |
| 102    | .6906030    | 80090 | .4760843     | 21114 | .2625993    | 91502 | .0501383     | 74406 | .8386914    | 94860 |
| 103    | .6777658    | 55385 | .4611439     | 71321 | .2455660    | 52203 | .0310220     | 83959 | .8175021    | 95790 |
| 104    | .6649286    | 30680 | .4462036     | 21528 | .2285327    | 12904 | 8.0119057    | 93512 | .7963128    | 96720 |
| 105    | .6520914    | 05975 | .4312632     | 71735 | .2114993    | 73605 | 7.9927895    | 03065 | .7751235    | 97650 |
| 106    | .6392541    | 81270 | .4163229     | 21942 | .1944660    | 34306 | .9736732     | 12618 | .7539342    | 98580 |
| 107    | .6264169    | 56565 | .4013825     | 72149 | .1774326    | 95007 | .9545569     | 22171 | .7327449    | 99510 |
| 108    | .6135797    | 31860 | .3864422     | 22356 | .1603993    | 55708 | .9354406     | 31724 | .7115557    | 00440 |
| 109    | .6007425    | 07155 | .3715018     | 72563 | .1433660    | 16409 | .9163243     | 41277 | .6903664    | 01370 |
| 110    | 8.5879052   | 82450 | 8.3565615    | 22770 | 8.1263326   | 77110 | 7.8972080    | 50830 | 7.6691771   | 02300 |



*Log. of the Present Value of £.1, due at the end of any number of Years.*

| YEARS. | 6 PER CENT. |       | 7 PER CENT. |       | 8 PER CENT. |       | 9 PER CENT. |       | 10 PER CENT. |       |
|--------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|--------------|-------|
| 1      | 9.9746941   | 34735 | 9.9706162   | 22315 | 9.9665762   | 44513 | 9.9625735   | 02059 | 9.9586073    | 14842 |
| 2      | .9493882    | 69470 | .9412324    | 44630 | .9331524    | 89026 | .9251470    | 04118 | .9172146     | 29684 |
| 3      | .9240824    | 04205 | .9118486    | 66945 | .8997287    | 33539 | .8877205    | 06177 | .8758219     | 44526 |
| 4      | .8987765    | 38940 | .8824648    | 89260 | .8663049    | 78052 | .8502940    | 08236 | .8344292     | 59368 |
| 5      | .8734706    | 73675 | .8530811    | 11575 | .8328812    | 22565 | .8128675    | 10295 | .7930365     | 74210 |
| 6      | .8481648    | 08410 | .8236973    | 33890 | .7994574    | 67078 | .7754410    | 12354 | .7516438     | 89052 |
| 7      | .8228589    | 43145 | .7943135    | 56205 | .7660337    | 11591 | .7380145    | 14413 | .7102512     | 03894 |
| 8      | .7975530    | 77880 | .7649297    | 78520 | .7326099    | 56104 | .7005880    | 16472 | .6688585     | 18736 |
| 9      | .7722472    | 12615 | .7355460    | 00835 | .6991862    | 00617 | .6631615    | 18531 | .6274658     | 33578 |
| 10     | .7469413    | 47350 | .7061622    | 23150 | .6657624    | 45130 | .6257350    | 20590 | .5860731     | 48420 |
| 11     | .7216354    | 82085 | .6767784    | 45465 | .6323386    | 89643 | .5883085    | 22649 | .5446804     | 63262 |
| 12     | .6963296    | 16820 | .6473946    | 67780 | .5989149    | 34156 | .5508820    | 24708 | .5032877     | 78104 |
| 13     | .6710237    | 51555 | .6180108    | 90095 | .5654911    | 78669 | .5134555    | 26767 | .4618950     | 92946 |
| 14     | .6457178    | 86290 | .5886271    | 12410 | .5320674    | 23182 | .4760290    | 28826 | .4205024     | 07788 |
| 15     | .6204120    | 21025 | .5592433    | 34725 | .4986436    | 67695 | .4386025    | 30885 | .3791097     | 22630 |
| 16     | .5951061    | 55760 | .5298595    | 57040 | .4652199    | 12208 | .4011760    | 32944 | .3377170     | 37472 |
| 17     | .5698002    | 90495 | .5004757    | 79355 | .4317961    | 56721 | .3637495    | 35003 | .2963243     | 52314 |
| 18     | .5444944    | 25230 | .4710920    | 01670 | .3983724    | 01234 | .3263230    | 37062 | .2549316     | 67156 |
| 19     | .5191885    | 59965 | .4417082    | 23985 | .3649486    | 45747 | .2888965    | 39121 | .2135389     | 81998 |
| 20     | .4938826    | 94700 | .4123244    | 46300 | .3315248    | 90260 | .2514700    | 41180 | .1721462     | 96840 |
| 21     | .4685768    | 29435 | .3829406    | 68615 | .2981011    | 34773 | .2140435    | 43239 | .1307536     | 11682 |
| 22     | .4432709    | 64170 | .3535568    | 90930 | .2646773    | 79286 | .1766170    | 45298 | .0893609     | 26524 |
| 23     | .4179650    | 98905 | .3241731    | 13245 | .2312536    | 23799 | .1391905    | 47357 | .0479682     | 41366 |
| 24     | .3926592    | 33640 | .2947893    | 35560 | .1978398    | 68312 | .1017640    | 49416 | 9.0065755    | 56208 |
| 25     | .3673533    | 68375 | .2654055    | 57875 | .1644061    | 12825 | .0643375    | 51475 | 8.9651828    | 71050 |
| 26     | .3420475    | 03110 | .2360217    | 80190 | .1309823    | 57338 | 9.0269110   | 53534 | .9237901     | 85892 |
| 27     | .3167416    | 37845 | .2066380    | 02505 | .0975586    | 01851 | 8.9894845   | 55593 | .8823975     | 00734 |
| 28     | .2914357    | 72580 | .1772542    | 24820 | .0641348    | 46364 | .9520580    | 57652 | .8410048     | 15576 |
| 29     | .2661299    | 07315 | .1478704    | 47135 | 9.0307110   | 90877 | .9146315    | 59711 | .7996121     | 30418 |
| 30     | .2408240    | 42050 | .1184866    | 69450 | 8.9972873   | 35390 | .8772050    | 61770 | .7582194     | 45260 |
| 31     | .2155181    | 76785 | .0891028    | 91765 | .9638635    | 79903 | .8397785    | 63829 | .7168267     | 60102 |
| 32     | .1902123    | 11520 | .0597191    | 14080 | .9304398    | 24416 | .8023520    | 65888 | .6754340     | 74944 |
| 33     | .1649064    | 46255 | .0303353    | 36395 | .8970160    | 68929 | .7649255    | 67947 | .6340413     | 89786 |
| 34     | .1396005    | 80990 | 9.0009515   | 58710 | .8635923    | 13442 | .7274990    | 70006 | .5926487     | 04628 |
| 35     | .1142947    | 15725 | 8.9715677   | 81025 | .8301685    | 57955 | .6900725    | 72065 | .5512560     | 19470 |
| 36     | .0889888    | 50460 | .9421840    | 03340 | .7967448    | 02468 | .6526460    | 74124 | .5098633     | 34312 |
| 37     | .0636829    | 85195 | .9128002    | 25655 | .7633210    | 46981 | .6152195    | 76183 | .4684706     | 49154 |
| 38     | .0383771    | 19930 | .8834164    | 47970 | .7298972    | 91494 | .5777930    | 78242 | .4270779     | 63996 |
| 39     | 9.0130712   | 54665 | .8540326    | 70285 | .6964735    | 36007 | .5403665    | 80301 | .3856852     | 78838 |
| 40     | 8.9877653   | 89400 | .8246488    | 92600 | .6630497    | 80520 | .5029400    | 82360 | .3442925     | 93680 |
| 41     | .9624595    | 24135 | .7952651    | 14915 | .6296260    | 25033 | .4655135    | 84419 | .3028999     | 08522 |
| 42     | .9371536    | 58870 | .7658813    | 37230 | .5962022    | 69546 | .4280870    | 86478 | .2615072     | 23364 |
| 43     | .9118477    | 93605 | .7364975    | 59545 | .5627785    | 14059 | .3906605    | 88537 | .2201145     | 38206 |
| 44     | .8865419    | 28340 | .7071137    | 81860 | .5293547    | 58572 | .3532340    | 90596 | .1787218     | 53048 |
| 45     | .8612360    | 63075 | .6777300    | 04175 | .4959310    | 03085 | .3158075    | 92655 | .1373291     | 67890 |
| 46     | .8359301    | 97810 | .6483462    | 26490 | .4625072    | 47598 | .2783810    | 94714 | .0959364     | 82732 |
| 47     | .8106243    | 32545 | .6189624    | 48805 | .4290834    | 92111 | .2409545    | 96773 | .0545437     | 97574 |
| 48     | .7853184    | 67280 | .5895786    | 71120 | .3956597    | 36624 | .2035280    | 98832 | 8.0131511    | 12416 |
| 49     | .7600126    | 02015 | .5601948    | 93435 | .3622359    | 81137 | .1661016    | 00891 | 7.9717584    | 27258 |
| 50     | .7347067    | 36750 | .5308111    | 15750 | .3288122    | 25650 | .1286751    | 02950 | .9303657     | 42100 |
| 51     | .7094008    | 71485 | .5014273    | 38065 | .2953884    | 70163 | .0912486    | 05009 | .8889730     | 56942 |
| 52     | .6840950    | 06220 | .4720435    | 60380 | .2619647    | 14676 | .0538221    | 07068 | .8475803     | 71784 |
| 53     | .6587891    | 40955 | .4426597    | 82695 | .2285409    | 59189 | 8.0163956   | 09127 | .8061876     | 86626 |
| 54     | .6334832    | 75690 | .4132760    | 05010 | .1951172    | 03702 | 7.9789691   | 11186 | .7647950     | 01468 |
| 55     | 8.6081774   | 10425 | 8.3838922   | 27325 | 8.1616934   | 48215 | 7.9415426   | 13245 | 7.7234023    | 16310 |



TABLE 15—(continued).

*Log. of the Present Value of £.1, due at the end of any number of Years.*

| YEARS. | 6 PER CENT. |       | 7 PER CENT. |       | 8 PER CENT. |       | 9 PER CENT. |       | 10 PER CENT. |       |
|--------|-------------|-------|-------------|-------|-------------|-------|-------------|-------|--------------|-------|
| 56     | 8.5828715   | 45160 | 8.3545084   | 49640 | 8.1282696   | 92728 | 7.9041161   | 15304 | 7.6820096    | 31152 |
| 57     | .5575656    | 79895 | .3251246    | 71955 | .0948459    | 37241 | .8666896    | 17363 | .6406169     | 45994 |
| 58     | .5322598    | 14630 | .2957408    | 94270 | .0614221    | 81754 | .8292631    | 19422 | .5992242     | 60836 |
| 59     | .5069539    | 49365 | .2663571    | 16585 | 8.0279984   | 26267 | .7918366    | 21481 | .5578315     | 75678 |
| 60     | .4816480    | 84100 | .2369733    | 38900 | 7.9945746   | 70780 | .7544101    | 23540 | .5164388     | 90520 |
| 61     | .4563422    | 18835 | .2075895    | 61215 | .9611509    | 15293 | .7169836    | 25599 | .4750462     | 05362 |
| 62     | .4310363    | 53570 | .1782057    | 83530 | .9277271    | 59806 | .6795571    | 27658 | .4336535     | 20204 |
| 63     | .4057304    | 88305 | .1488220    | 05845 | .8943034    | 04319 | .6421306    | 29717 | .3922608     | 35046 |
| 64     | .3804246    | 23040 | .1194382    | 28160 | .8608796    | 48832 | .6047041    | 31776 | .3508681     | 49888 |
| 65     | .3551187    | 57775 | .0900544    | 50475 | .8274558    | 93345 | .5672776    | 33835 | .3094754     | 64730 |
| 66     | .3298128    | 92510 | .0606706    | 72790 | .7940321    | 37858 | .5298511    | 35894 | .2680827     | 79572 |
| 67     | .3045070    | 27245 | .0312868    | 95105 | .7606083    | 82371 | .4924246    | 37953 | .2266900     | 94414 |
| 68     | .2792011    | 61980 | 8.0019031   | 17420 | .7271846    | 26884 | .4549981    | 40012 | .1852974     | 09256 |
| 69     | .2538952    | 96715 | 7.9725193   | 39735 | .6937608    | 71397 | .4175716    | 42071 | .1439047     | 24098 |
| 70     | .2285894    | 31450 | .9431355    | 62050 | .6603371    | 15910 | .3801451    | 44130 | .1025120     | 38940 |
| 71     | .2032835    | 66185 | .9137517    | 84365 | .6269133    | 60423 | .3427186    | 46189 | .0611193     | 53782 |
| 72     | .1779777    | 00920 | .8843680    | 06680 | .5934896    | 04936 | .3052921    | 48248 | 7.0197266    | 68624 |
| 73     | .1526718    | 35655 | .8549842    | 28995 | .5600658    | 49449 | .2678656    | 50307 | 6.9783339    | 83466 |
| 74     | .1273659    | 70390 | .8256004    | 51310 | .5266420    | 93962 | .2304391    | 52366 | .9369412     | 98308 |
| 75     | .1020601    | 05125 | .7962166    | 73625 | .4932183    | 38475 | .1930126    | 54425 | .8955486     | 13150 |
| 76     | .0767542    | 39860 | .7668328    | 95940 | .4597945    | 82988 | .1555861    | 56484 | .8541559     | 27992 |
| 77     | .0514483    | 74595 | .7374491    | 18255 | .4263708    | 27501 | .1181596    | 58543 | .8127632     | 42834 |
| 78     | .0261425    | 09330 | .7080653    | 40570 | .3929470    | 72014 | .0807331    | 60602 | .7713705     | 57676 |
| 79     | 8.0008366   | 44065 | .6786815    | 62885 | .3595233    | 16527 | .0433066    | 62661 | .7299778     | 72518 |
| 80     | 7.9755307   | 78800 | .6492977    | 85200 | .3260995    | 61040 | 7.0058801   | 64720 | .6885851     | 87360 |
| 81     | .9502249    | 13535 | .6199140    | 07515 | .2926758    | 05553 | 6.9684536   | 66779 | .6471925     | 02202 |
| 82     | .9249190    | 48270 | .5905302    | 29830 | .2592520    | 50066 | .9310271    | 68838 | .6057998     | 17044 |
| 83     | .8996131    | 83005 | .5611464    | 52145 | .2258282    | 94579 | .8936006    | 70897 | .5644071     | 31886 |
| 84     | .8743073    | 17740 | .5317626    | 74460 | .1924045    | 39092 | .8561741    | 72956 | .5230144     | 46728 |
| 85     | .8490014    | 52475 | .5023788    | 96775 | .1589807    | 83605 | .8187476    | 75015 | .4816217     | 61570 |
| 86     | .8236955    | 87210 | .4729951    | 19090 | .1255570    | 28118 | .7813211    | 77074 | .4402290     | 76412 |
| 87     | .7983897    | 21945 | .4436113    | 41405 | .0921332    | 72631 | .7438946    | 79133 | .3988363     | 91254 |
| 88     | .7730838    | 56680 | .4142275    | 63720 | .0587095    | 17144 | .7064681    | 81192 | .3574437     | 06096 |
| 89     | .7477779    | 91415 | .3848437    | 86035 | 7.0252857   | 61657 | .6690416    | 83251 | .3160510     | 20938 |
| 90     | .7224721    | 26150 | .3554600    | 08350 | 6.9918620   | 06170 | .6316151    | 85310 | .2746583     | 35780 |
| 91     | .6971662    | 60885 | .3260762    | 30665 | .9584382    | 50683 | .5941886    | 87369 | .2332656     | 50622 |
| 92     | .6718603    | 95620 | .2966924    | 52980 | .9250144    | 95196 | .5567621    | 89428 | .1918729     | 65464 |
| 93     | .6465545    | 30355 | .2673086    | 75295 | .8915907    | 39709 | .5193356    | 91487 | .1504802     | 80306 |
| 94     | .6212486    | 65090 | .2379248    | 97610 | .8581669    | 84222 | .4819091    | 93546 | .1090875     | 95148 |
| 95     | .5959427    | 99825 | .2085411    | 19925 | .8247432    | 28735 | .4444826    | 95605 | .0676949     | 09990 |
| 96     | .5706369    | 34560 | .1791573    | 42240 | .7913194    | 73248 | .4070561    | 97664 | 6.0263022    | 24832 |
| 97     | .5453310    | 69295 | .1497735    | 64555 | .7578957    | 17761 | .3696296    | 99723 | 5.9849095    | 39674 |
| 98     | .5200252    | 04030 | .1203897    | 86870 | .7244719    | 62274 | .3322032    | 01782 | .9435168     | 54516 |
| 99     | .4947193    | 38765 | .0910060    | 09185 | .6910482    | 06787 | .2947767    | 03841 | .9021241     | 69358 |
| 100    | .4694134    | 73500 | .0616222    | 31500 | .6576244    | 51300 | .2573502    | 05900 | .8607314     | 84200 |
| 101    | .4441076    | 08235 | .0322384    | 53815 | .6242006    | 95813 | .2199237    | 07959 | .8193387     | 99042 |
| 102    | .4188017    | 42970 | 7.0028546   | 76130 | .5907769    | 40326 | .1824972    | 10018 | .7779461     | 13884 |
| 103    | .3934958    | 77705 | 6.9734708   | 98445 | .5573531    | 84839 | .1450707    | 12077 | .7365534     | 28726 |
| 104    | .3681900    | 12440 | .9440871    | 20760 | .5239294    | 29352 | .1076442    | 14136 | .6951607     | 43568 |
| 105    | .3428841    | 47175 | .9147033    | 43075 | .4905056    | 73865 | .0702177    | 16195 | .6537680     | 58410 |
| 106    | .3175782    | 81910 | .8853195    | 65390 | .4570819    | 18378 | 6.0327912   | 18254 | .6123753     | 73252 |
| 107    | .2922724    | 16645 | .8559357    | 87705 | .4236581    | 62891 | 5.9953647   | 20313 | .5709826     | 88094 |
| 108    | .2669665    | 51380 | .8265520    | 10020 | .3902344    | 07404 | .9579382    | 22372 | .5295900     | 02936 |
| 109    | .2416606    | 86115 | .7971682    | 32335 | .3568106    | 51917 | .9205117    | 24431 | .4881973     | 17778 |
| 110    | 7.2163548   | 20850 | 6.7677844   | 54650 | 6.3233868   | 96430 | 5.8830852   | 26490 | 5.4468046    | 32620 |



TABLE 16.

*Friendly Societies.—England and Wales.—Three Districts.—Three per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$    | $\lambda. N_x$ | $N_x$      | $\lambda. N_x^s$ | $N_x^s$    | Age<br>$x$ . |
|--------------|----------------|----------|----------------|------------|------------------|------------|--------------|
| 10           | 4.8716278      | 74409.40 | 6.2583604      | 1812843.88 | 6.5274486        | 3368694.15 | 10           |
| 11           | .8577034       | 72061.52 | .2407445       | 1740782.36 | .5230358         | 3334539.13 | 11           |
| 12           | .8437807       | 69788.00 | .2229749       | 1670994.36 | .5178116         | 3294667.43 | 12           |
| 13           | .8297854       | 67574.90 | .2050472       | 1603419.46 | .5119609         | 3250580.65 | 13           |
| 14           | .8156420       | 65409.68 | .1869591       | 1538009.78 | .5056479         | 3203671.01 | 14           |
| 15           | .8012789       | 63281.81 | .1687119       | 1474727.97 | .4990282         | 3155209.84 | 15           |
| 16           | .7866231       | 61181.91 | .1503099       | 1413546.06 | .4922537         | 3106373.72 | 16           |
| 17           | .7715995       | 59101.64 | .1317611       | 1354444.42 | .4854727         | 3058247.94 | 17           |
| 18           | .7562789       | 57053.05 | .1130710       | 1297391.37 | .4787084         | 3010984.09 | 18           |
| 19           | .7407325       | 55046.85 | .0942421       | 1242344.52 | .4719852         | 2964723.32 | 19           |
| 20           | .7250333       | 53092.51 | .0752739       | 1189252.01 | .4653203         | 2919579.45 | 20           |
| 21           | .7092514       | 51197.81 | .0561630       | 1138054.20 | .4587363         | 2875651.25 | 21           |
| 22           | .6934585       | 49369.48 | .0369021       | 1088684.72 | .4522486         | 2833013.28 | 22           |
| 23           | .6776452       | 47604.20 | 6.0174843      | 1041080.52 | .4458526         | 2791596.41 | 23           |
| 24           | .6618115       | 45899.87 | 5.9979019      | 995180.65  | .4395429         | 2751332.15 | 24           |
| 25           | .6459476       | 44253.50 | .9781473       | 950927.15  | .4333162         | 2712165.74 | 25           |
| 26           | .6300531       | 42663.17 | .9582121       | 908263.98  | .4271683         | 2674042.33 | 26           |
| 27           | .6141177       | 41126.11 | .9380881       | 867137.87  | .4210954         | 2636910.65 | 27           |
| 28           | .5981363       | 39640.25 | .9177667       | 827497.62  | .4151051         | 2600788.53 | 28           |
| 29           | .5821078       | 38203.91 | .8972387       | 789293.71  | .4092036         | 2565686.39 | 29           |
| 30           | .5660265       | 36815.14 | .8764941       | 752478.57  | .4033977         | 2531615.27 | 30           |
| 31           | .5498913       | 35472.46 | .8555229       | 717006.11  | .3976938         | 2498583.19 | 31           |
| 32           | .5336964       | 34174.05 | .8343139       | 682832.06  | .3920972         | 2466591.56 | 32           |
| 33           | .5174406       | 32918.55 | .8128555       | 649913.51  | .3865788         | 2435447.70 | 33           |
| 34           | .5011225       | 31704.61 | .7911352       | 618208.90  | .3811107         | 2404974.52 | 34           |
| 35           | .4847358       | 30530.64 | .7691396       | 587678.26  | .3756665         | 2375015.99 | 35           |
| 36           | .4682791       | 29395.38 | .7468544       | 558282.88  | .3702224         | 2345429.84 | 36           |
| 37           | .4517509       | 28297.69 | .7242638       | 529985.19  | .3647559         | 2316092.37 | 37           |
| 38           | .4351392       | 27235.74 | .7013515       | 502749.45  | .3592456         | 2286891.37 | 38           |
| 39           | .4184315       | 26207.85 | .6781009       | 476541.60  | .3536713         | 2257726.31 | 39           |
| 40           | .4016205       | 25212.77 | .6544931       | 451328.83  | .3480157         | 2228515.50 | 40           |
| 41           | .3846875       | 24248.65 | .6305094       | 427080.18  | .3421267         | 2198501.00 | 41           |
| 42           | .3676240       | 23314.39 | .6061295       | 403765.79  | .3362575         | 2168989.30 | 42           |
| 43           | .3504156       | 22408.65 | .5813319       | 381357.14  | .3302653         | 2139268.62 | 43           |
| 44           | .3330475       | 21530.17 | .5560937       | 359826.97  | .3241426         | 2109320.50 | 44           |
| 45           | .3155039       | 20677.78 | .5303908       | 339149.19  | .3178820         | 2079131.58 | 45           |
| 46           | .2977739       | 19850.61 | .5041970       | 319298.58  | .3114779         | 2048697.55 | 46           |
| 47           | .2798461       | 19047.86 | .4774840       | 300250.72  | .3049247         | 2018016.11 | 47           |
| 48           | .2616796       | 18267.53 | .4502232       | 281983.19  | .2981977         | 1986999.05 | 48           |
| 49           | .2432430       | 17508.26 | .4223845       | 264474.93  | .2912741         | 1955573.50 | 49           |
| 50           | .2245029       | 16768.83 | .3939367       | 247706.10  | .2841342         | 1923686.03 | 50           |
| 51           | .2054238       | 16048.11 | .3648473       | 231657.99  | .2767604         | 1891299.86 | 51           |
| 52           | .1859739       | 15345.25 | .3350821       | 216312.74  | .2691379         | 1858394.11 | 52           |
| 53           | .1661250       | 14659.69 | .3046048       | 201653.05  | .2612367         | 1824890.05 | 53           |
| 54           | .1458592       | 13991.34 | .2733756       | 187661.71  | .2530306         | 1790732.23 | 54           |
| 55           | 4.1251567      | 13340.03 | 5.2413514      | 174321.68  | 6.2444964        | 1755886.21 | 55           |



TABLE 16—(continued).

*Friendly Societies.—England and Wales.—Three Districts.—Three per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$    | $\lambda. N_x$ | $N_x$     | $\lambda. N_x^s$ | $N_x^s$    | Age<br>$x$ . |
|--------------|----------------|----------|----------------|-----------|------------------|------------|--------------|
| 55           | 4.1251567      | 13340.03 | 5.2413514      | 174321.68 | 6.2444964        | 1755886.21 | 55           |
| 56           | .1039958       | 12705.62 | .2084845       | 161616.06 | .2356139         | 1720338.64 | 56           |
| 57           | .0823526       | 12087.94 | .1747228       | 149528.12 | .2261480         | 1683247.63 | 57           |
| 58           | .0602004       | 11486.84 | .1400090       | 138041.28 | .2164000         | 1645886.92 | 58           |
| 59           | .0375098       | 10902.09 | .1042794       | 127139.19 | .2060368         | 1607077.25 | 59           |
| 60           | 4.0142483      | 10333.52 | .0674639       | 116805.67 | .1949471         | 1566560.12 | 60           |
| 61           | 3.9903939      | 9781.24  | 5.0294829      | 107024.43 | .1830277         | 1524149.90 | 61           |
| 62           | .9659147       | 9245.17  | 4.9902468      | 97779.26  | .1701812         | 1479725.72 | 62           |
| 63           | .9406510       | 8722.70  | .9496660       | 89056.56  | .1560791         | 1432448.75 | 63           |
| 64           | .9144554       | 8212.12  | .9076502       | 80844.44  | .1404083         | 1381682.60 | 64           |
| 65           | .8871685       | 7712.03  | .8641099       | 73132.41  | .1228660         | 1326984.98 | 65           |
| 66           | .8586240       | 7221.44  | .8189577       | 65910.97  | .1031533         | 1268099.28 | 66           |
| 67           | .8286727       | 6740.20  | .7721072       | 59170.77  | .0809686         | 1204948.98 | 67           |
| 68           | .7971196       | 6267.87  | .7234795       | 52902.90  | .0561774         | 1138092.13 | 68           |
| 69           | .7637708       | 5804.58  | .6730054       | 47098.32  | 6.0286336        | 1068153.23 | 69           |
| 70           | .7284220       | 5350.84  | .6206303       | 41747.48  | 5.9981782        | 995813.85  | 70           |
| 71           | .6908775       | 4907.69  | .5663171       | 36839.79  | .9646381         | 921803.00  | 71           |
| 72           | .6509307       | 4476.42  | .5100538       | 32363.37  | .9278237         | 846883.49  | 72           |
| 73           | .6087956       | 4062.52  | .4517995       | 28300.85  | .8876525         | 772062.42  | 73           |
| 74           | .5646728       | 3670.06  | .3914783       | 24630.79  | .8439887         | 698214.17  | 74           |
| 75           | .5187797       | 3302.02  | .3289658       | 21328.77  | .7966266         | 626075.29  | 75           |
| 76           | .4713272       | 2960.24  | .2640744       | 18368.53  | .7452632         | 556241.27  | 76           |
| 77           | .4225301       | 2645.63  | .1965326       | 15722.90  | .6894621         | 489172.64  | 77           |
| 78           | .3718844       | 2354.41  | .1260823       | 13368.49  | .6292167         | 425810.80  | 78           |
| 79           | .3188831       | 2083.93  | 4.0524847      | 11284.56  | .5645286         | 366883.89  | 79           |
| 80           | .2630121       | 1832.36  | 3.9755329      | 9452.20   | .4954412         | 312925.68  | 80           |
| 81           | .2036197       | 1598.16  | .8950931       | 7854.04   | .4220813         | 264290.35  | 81           |
| 82           | .1403887       | 1381.62  | .8110666       | 6472.42   | .3447372         | 221175.50  | 82           |
| 83           | .0737595       | 1185.11  | .7232348       | 5287.31   | .2629038         | 183190.86  | 83           |
| 84           | 3.0043149      | 1009.98  | .6311728       | 4277.33   | .1758139         | 149904.25  | 84           |
| 85           | 2.9326232      | 856.29   | .5341582       | 3421.04   | 5.0822675        | 120855.78  | 85           |
| 86           | .8592670       | 723.21   | .4310146       | 2697.83   | 4.9803780        | 95582.43   | 86           |
| 87           | .7848922       | 609.39   | .3198220       | 2088.44   | .8670686         | 73632.33   | 87           |
| 88           | .7064583       | 508.70   | .1985856       | 1579.74   | .7400579         | 54961.41   | 88           |
| 89           | .6209150       | 417.75   | 3.0652024      | 1161.99   | .5966307         | 39503.058  | 89           |
| 90           | .5249853       | 334.95   | 2.9175265      | 827.04    | .4336034         | 27139.588  | 90           |
| 91           | .4152381       | 260.16   | .7534911       | 566.88    | .2473214         | 17673.454  | 91           |
| 92           | .2877656       | 193.98   | .5715924       | 372.90    | 4.0337961        | 10809.264  | 92           |
| 93           | 2.1405919      | 138.23   | .3704576       | 234.67    | 3.7883009        | 6141.874   | 93           |
| 94           | 1.9740001      | 94.19    | 2.1476145      | 140.48    | .5050335         | 3199.142   | 94           |
| 95           | .7869297       | 61.23    | 1.8989993      | 79.25     | 3.1752630        | 1497.142   | 95           |
| 96           | .5778589       | 37.83    | .6172101       | 41.42     | 2.7876460        | 613.262    | 96           |
| 97           | .3458538       | 22.17    | 1.2844307      | 19.25     | 2.3502596        | 224.006    | 97           |
| 98           | 1.0723658      | 11.81    | 0.8715729      | 7.44      | 1.8378282        | 68.837     | 98           |
| 99           | 0.7334362      | 5.41     | 0.3074960      | 2.03      | 1.1856555        | 15.334     | 99           |
| 100          | 0.3073421      | 2.03     | ...            | 0.00      | 0.6212802        | 4.181      | 100          |



TABLE 17.

*Friendly Societies.—England and Wales.—Three Districts.—Three-and-half per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$    | $\lambda. N_x$ | $N_x$      | $\lambda. N_x^s$ | $N_x^s$    | Age<br>$x$ . |
|--------------|----------------|----------|----------------|------------|------------------|------------|--------------|
| 10           | 4.8505965      | 70891.88 | 6.1951873      | 1567426.96 | 6.4205572        | 2633645.06 | 10           |
| 11           | .8345691       | 68323.35 | .1758317       | 1499103.61 | .4151711         | 2601184.60 | 11           |
| 12           | .8185432       | 65848.09 | .1563237       | 1433255.52 | .4088289         | 2563474.15 | 12           |
| 13           | .8024448       | 63451.93 | .1366584       | 1369803.59 | .4017414         | 2521978.54 | 13           |
| 14           | .7861982       | 61122.08 | .1168340       | 1308681.51 | .3941082         | 2478039.27 | 14           |
| 15           | .7697321       | 58848.05 | .0968522       | 1249833.46 | .3861182         | 2432866.00 | 15           |
| 16           | .7529730       | 56620.41 | .0767180       | 1193213.05 | .3779549         | 2387563.14 | 16           |
| 17           | .7358464       | 54431.01 | .0564407       | 1138782.04 | .3697973         | 2343134.92 | 17           |
| 18           | .7184226       | 52290.48 | .0360263       | 1086491.56 | .3616737         | 2299713.16 | 18           |
| 19           | .7007732       | 50208.04 | 6.0154787      | 1036283.52 | .3536120         | 2257418.27 | 19           |
| 20           | .6829708       | 48191.53 | 5.9947974      | 988091.99  | .3456371         | 2216343.91 | 20           |
| 21           | .6650858       | 46247.23 | .9739793       | 941844.76  | .3377723         | 2176568.73 | 21           |
| 22           | .6471897       | 44380.24 | .9530173       | 897464.52  | .3300378         | 2138148.30 | 22           |
| 23           | .6292734       | 42586.65 | .9319041       | 854877.87  | .3224279         | 2101008.47 | 23           |
| 24           | .6113365       | 40863.58 | .9106320       | 814014.29  | .3149362         | 2065076.65 | 24           |
| 25           | .5933695       | 39207.53 | .8891934       | 774806.76  | .3075588         | 2030293.41 | 25           |
| 26           | .5753718       | 37615.93 | .8675799       | 737190.83  | .2995835         | 1996599.99 | 26           |
| 27           | .5573334       | 36085.56 | .8457833       | 701105.27  | .2931286         | 1963941.61 | 27           |
| 28           | .5392488       | 34613.76 | .8237946       | 666491.51  | .2860801         | 1932324.64 | 28           |
| 29           | .5211172       | 33198.41 | .8016048       | 633293.10  | .2791531         | 1901748.94 | 29           |
| 30           | .5029327       | 31837.04 | .7792039       | 601456.06  | .2723556         | 1872214.61 | 30           |
| 31           | .4846945       | 30527.73 | .7565816       | 570928.33  | .2656949         | 1843719.30 | 31           |
| 32           | .4663964       | 29268.23 | .7337269       | 541660.10  | .2591769         | 1816254.85 | 32           |
| 33           | .4480375       | 28056.76 | .7106278       | 513603.34  | .2527675         | 1789647.38 | 33           |
| 34           | .4296162       | 26891.57 | .6872719       | 486711.77  | .2464342         | 1763738.66 | 34           |
| 35           | .4111265       | 25770.72 | .6636454       | 460941.05  | .2401473         | 1738390.55 | 35           |
| 36           | .3925666       | 24692.59 | .6397339       | 436248.46  | .2338786         | 1713478.44 | 36           |
| 37           | .3739353       | 23655.67 | .6155216       | 412592.79  | .2276026         | 1688895.07 | 37           |
| 38           | .3552204       | 22657.94 | .5909921       | 389934.85  | .2212953         | 1664544.26 | 38           |
| 39           | .3364097       | 21697.50 | .5661279       | 368237.35  | .2149341         | 1640340.91 | 39           |
| 40           | .3174955       | 20772.82 | .5409105       | 347464.53  | .2084996         | 1616216.70 | 40           |
| 41           | .2984594       | 19881.97 | .5153207       | 327582.56  | .2019730         | 1592110.03 | 41           |
| 42           | .2792927       | 19023.60 | .4893381       | 308558.96  | .1953384         | 1567972.25 | 42           |
| 43           | .2599813       | 18196.22 | .4629409       | 290362.74  | .1885857         | 1543780.97 | 43           |
| 44           | .2405100       | 17398.43 | .4361059       | 272964.31  | .1817071         | 1519522.32 | 44           |
| 45           | .2208633       | 16628.89 | .4088086       | 256335.42  | .1746954         | 1495186.76 | 45           |
| 46           | .2010301       | 15886.57 | .3810408       | 240448.85  | .1675454         | 1470772.14 | 46           |
| 47           | .1809993       | 15170.48 | .3527195       | 225278.37  | .1602518         | 1446277.94 | 47           |
| 48           | .1607296       | 14478.70 | .3238609       | 210799.67  | .1527883         | 1421635.43 | 48           |
| 49           | .1401899       | 13809.88 | .2944437       | 196989.79  | .1451308         | 1396788.99 | 49           |
| 50           | .1193466       | 13162.75 | .2644094       | 183827.04  | .1372588         | 1371699.13 | 50           |
| 51           | .0981645       | 12536.16 | .2337342       | 171290.88  | .1291547         | 1346339.98 | 51           |
| 52           | .0766114       | 11929.20 | .2023839       | 159361.68  | .1208037         | 1320698.46 | 52           |
| 53           | .0546594       | 11341.21 | .1703218       | 148020.47  | .1121748         | 1294716.84 | 53           |
| 54           | .0322904       | 10771.85 | .1375080       | 137248.62  | .1032412         | 1268356.20 | 54           |
| 55           | 4.0094849      | 10220.80 | 5.1038988      | 127027.82  | 6.0949797        | 1241594.37 | 55           |



TABLE 17—(continued).

*Friendly Societies.—England and Wales.—Three Districts.—Three-and-half per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$    | $\lambda. N_x$ | $N_x$     | $\lambda. N_x^s$ | $N_x^s$    | Age<br>$x$ . |
|--------------|----------------|----------|----------------|-----------|------------------|------------|--------------|
| 55           | 4.0094849      | 10220.80 | 5.1038988      | 127027.82 | 6.0949797        | 1241594.37 | 55           |
| 56           | 3.9862208      | 9687.70  | .0694466       | 117340.12 | .0843709         | 1214425.63 | 56           |
| 57           | .9624745       | 9172.22  | 5.0340984      | 108167.90 | .0743981         | 1186856.38 | 57           |
| 58           | .9382191       | 8673.99  | 4.9977965      | 99493.91  | .0639249         | 1158577.10 | 58           |
| 59           | .9134255       | 8192.67  | .9604767       | 91301.24  | .0528259         | 1129342.97 | 59           |
| 60           | .8880608       | 7727.89  | .9220678       | 83573.35  | .0409859         | 1098970.11 | 60           |
| 61           | .8621033       | 7279.53  | .8824894       | 76293.82  | .0282994         | 1067331.72 | 61           |
| 62           | .8355209       | 6847.32  | .8416504       | 69446.50  | 6.0146679        | 1034350.99 | 62           |
| 63           | .8081542       | 6429.16  | .7994600       | 63017.34  | 5.9997488        | 999421.91  | 63           |
| 64           | .7798554       | 6023.59  | .7558272       | 56993.75  | .9832185         | 962096.14  | 64           |
| 65           | .7504654       | 5629.44  | .7106614       | 51364.31  | .9647658         | 922074.06  | 65           |
| 66           | .7198177       | 5245.87  | .6638746       | 46118.44  | .9440855         | 879195.69  | 66           |
| 67           | .6877634       | 4872.63  | .6153798       | 41245.81  | .9208713         | 833434.17  | 67           |
| 68           | .6541071       | 4509.28  | .5650982       | 36736.53  | .8949918         | 785220.76  | 68           |
| 69           | .6186552       | 4155.81  | .5129607       | 32580.72  | .8663042         | 735028.40  | 69           |
| 70           | .5812032       | 3812.44  | .4589139       | 28768.28  | .8346522         | 683364.09  | 70           |
| 71           | .5415557       | 3479.81  | .4029226       | 25288.47  | .7998651         | 630761.41  | 71           |
| 72           | .4995057       | 3158.68  | .3449773       | 22129.79  | .7617550         | 577770.11  | 72           |
| 73           | .4552675       | 2852.78  | .2850396       | 19277.01  | .7202454         | 525104.12  | 73           |
| 74           | .4090415       | 2564.73  | .2230357       | 16712.28  | .6752044         | 473374.00  | 74           |
| 75           | .3610454       | 2296.39  | .1588415       | 14415.89  | .6264281         | 423085.41  | 75           |
| 76           | .3114897       | 2048.75  | .0922693       | 12367.14  | .5736127         | 374638.73  | 76           |
| 77           | .2605895       | 1822.17  | 4.0230453      | 10544.97  | .5163176         | 328335.30  | 77           |
| 78           | .2078406       | 1613.77  | 3.9509098      | 8931.20   | .4545435         | 284802.31  | 78           |
| 79           | .1527363       | 1421.47  | .8756243       | 7509.73   | .3883000         | 244511.93  | 79           |
| 80           | .0947621       | 1243.83  | .7969835       | 6265.90   | .3176393         | 207797.05  | 80           |
| 81           | 3.0332666      | 1079.61  | .7148568       | 5186.29   | .2427001         | 174863.90  | 81           |
| 82           | 2.9679324      | 928.82   | .6291516       | 4257.47   | .1637872         | 145809.95  | 82           |
| 83           | .8992002       | 792.87   | .5396531       | 3464.60   | 5.0803984        | 120336.78  | 83           |
| 84           | .8276524       | 672.44   | .4459403       | 2792.16   | 4.9917665        | 98122.03   | 84           |
| 85           | .7538576       | 567.36   | .3472910       | 2224.80   | .8966880         | 78829.37   | 85           |
| 86           | .6783982       | 476.87   | .2425240       | 1747.93   | .7932668         | 62125.06   | 86           |
| 87           | .6019203       | 399.87   | .1297092       | 1348.06   | .6784157         | 47688.73   | 87           |
| 88           | .5213833       | 332.19   | 3.0068381      | 1015.87   | .5498270         | 35467.21   | 88           |
| 89           | .4337369       | 271.48   | 2.8718005      | 744.39    | .4047899         | 25397.44   | 89           |
| 90           | .3357040       | 216.62   | .7224447       | 527.77    | .2401152         | 17382.62   | 90           |
| 91           | .2238537       | 167.44   | .5567004       | 360.33    | 4.0521432        | 11275.69   | 91           |
| 92           | 2.0942781      | 124.24   | .3730776       | 236.09    | 3.8368783        | 6868.76    | 92           |
| 93           | 1.9450013      | 88.11    | 2.1702030      | 147.98    | .5895799         | 3886.69    | 93           |
| 94           | .7763063       | 59.75    | 1.5456163      | 88.23     | 3.3041065        | 2015.61    | 94           |
| 95           | .5871328       | 38.65    | .6953065       | 49.58     | 2.9725083        | 938.66     | 95           |
| 96           | .3759589       | 23.77    | .4117880       | 25.81     | .5836068         | 383.36     | 96           |
| 97           | 1.1418507      | 13.86    | 1.0773679      | 11.95     | 2.1443562        | 139.43     | 97           |
| 98           | 0.8662595      | 7.35     | 0.6627578      | 4.60      | 1.6300209        | 42.66      | 98           |
| 99           | .5252268       | 3.35     | 0.0969100      | 1.25      | 0.9758911        | 9.46       | 99           |
| 100          | 0.0970296      | 1.25     | ...            | 0.00      | 0.4099331        | 2.57       | 100          |



TABLE 18.

*Friendly Societies.—England and Wales.—Three Districts.—Four per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$    | $\lambda. N_x$ | $N_x$      | $\lambda. N_x^s$ | $N_x^s$    | Age<br>$x$ . |
|--------------|----------------|----------|----------------|------------|------------------|------------|--------------|
| 10           | 4.8296667      | 67556.43 | 6.1348105      | 1363987.96 | 6.3199471        | 2089041.74 | 10           |
| 11           | .8115462       | 64795.70 | .1136735       | 1299192.26 | .3134843         | 2058184.34 | 11           |
| 12           | .7934274       | 62148.03 | .0923852       | 1237044.23 | .3058903         | 2022508.58 | 12           |
| 13           | .7752360       | 59598.58 | .0709409       | 1177445.65 | .2974192         | 1983440.62 | 13           |
| 14           | .7568964       | 57134.24 | .0493388       | 1120311.41 | .2883098         | 1942270.84 | 14           |
| 15           | .7383373       | 54744.10 | .0275809       | 1065567.31 | .2787875         | 1900148.34 | 15           |
| 16           | .7194853       | 52418.58 | 6.0056732      | 1013148.73 | .2690710         | 1858108.09 | 16           |
| 17           | .7002656       | 50149.38 | 5.9836261      | 962999.35  | .2593735         | 1817077.69 | 17           |
| 18           | .6807489       | 47945.61 | .9614466       | 915053.74  | .2497289         | 1777169.60 | 18           |
| 19           | .6640065       | 45814.87 | .9391391       | 869238.87  | .2401707         | 1738484.06 | 19           |
| 20           | .6411111       | 43763.40 | .9167042       | 825475.47  | .2307287         | 1701095.52 | 20           |
| 21           | .6211330       | 41795.84 | .8941385       | 783679.63  | .2214306         | 1665063.64 | 21           |
| 22           | .6011440       | 39915.73 | .8714350       | 743763.90  | .2123012         | 1630426.36 | 22           |
| 23           | .5811346       | 38118.39 | .8485866       | 705645.51  | .2033333         | 1597104.54 | 23           |
| 24           | .5611048       | 36400.28 | .8255853       | 669245.23  | .1945203         | 1565021.55 | 24           |
| 25           | .5410448       | 34757.20 | .8024234       | 634488.03  | .1858575         | 1534113.42 | 25           |
| 26           | .5209542       | 33185.95 | .7790927       | 601302.08  | .1773396         | 1504317.64 | 26           |
| 27           | .5008228       | 31682.74 | .7555847       | 569619.34  | .1689616         | 1475576.01 | 27           |
| 28           | .4806453       | 30244.42 | .7318907       | 539374.92  | .1607340         | 1447884.67 | 28           |
| 29           | .4604206       | 28868.26 | .7080014       | 510506.66  | .1526656         | 1421233.99 | 29           |
| 30           | .4401432       | 27551.37 | .6839070       | 482955.29  | .1447656         | 1395614.82 | 30           |
| 31           | .4198120       | 26291.30 | .6595968       | 456663.99  | .1370425         | 1371015.77 | 31           |
| 32           | .3994209       | 25085.39 | .6350599       | 431578.60  | .1295032         | 1347420.62 | 32           |
| 33           | .3789690       | 23931.45 | .6102844       | 407647.15  | .1221082         | 1324671.61 | 33           |
| 34           | .3584548       | 22827.32 | .5852574       | 384819.83  | .1148199         | 1302626.52 | 34           |
| 35           | .3378720       | 21770.68 | .5599654       | 363049.15  | .1076041         | 1281162.13 | 35           |
| 36           | .3172192       | 20759.61 | .5343936       | 342289.54  | .1004286         | 1260168.36 | 36           |
| 37           | .2964949       | 19792.24 | .5085261       | 322497.30  | .0932545         | 1239551.22 | 37           |
| 38           | .2756870       | 18866.31 | .4823461       | 303630.99  | .0860847         | 1219227.31 | 38           |
| 39           | .2547833       | 17979.74 | .4558361       | 285651.25  | .0788639         | 1199123.59 | 39           |
| 40           | .2337762       | 17130.74 | .4289774       | 268520.51  | .0715808         | 1179181.94 | 40           |
| 41           | .2126470       | 16317.25 | .4017507       | 252203.26  | .0642148         | 1159350.59 | 41           |
| 42           | .1913874       | 15537.72 | .3741351       | 236665.54  | .0567483         | 1139589.12 | 42           |
| 43           | .1699830       | 14790.50 | .3471085       | 221875.04  | .0491711         | 1119879.06 | 43           |
| 44           | .1484187       | 14074.04 | .3176476       | 207801.00  | .0414752         | 1100209.14 | 44           |
| 45           | .1266790       | 13386.87 | .2887278       | 194414.13  | .0336536         | 1080571.72 | 45           |
| 46           | .1047529       | 12727.79 | .2593222       | 181686.34  | .0257011         | 1060965.21 | 46           |
| 47           | .0826290       | 12095.64 | .2294020       | 169590.70  | .0176131         | 1041389.37 | 47           |
| 48           | .0602664       | 11488.58 | .1989377       | 158102.12  | .0093615         | 1021789.68 | 48           |
| 49           | .0376337       | 10905.20 | .1678987       | 147196.92  | 6.0009209        | 1002122.80 | 49           |
| 50           | 4.0146974      | 10344.21 | .1362544       | 136852.71  | 5.9922701        | 982358.72  | 50           |
| 51           | 3.9914223      | 9804.43  | .1039688       | 127048.28  | .9833911         | 962478.56  | 51           |
| 52           | .9677763       | 9284.88  | .0710104       | 117763.40  | .9742692         | 942473.68  | 52           |
| 53           | .9437312       | 8784.79  | .0373413       | 108978.61  | .9648726         | 922300.91  | 53           |
| 54           | .9192693       | 8303.66  | 5.0029214      | 100674.95  | .9551739         | 901932.26  | 54           |
| 55           | 3.8943708      | 7840.99  | 4.9677069      | 92833.96   | 5.9451499        | 881353.03  | 55           |



TABLE 18—(continued).

*Friendly Societies.—England and Wales.—Three Districts.—Four per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$   | $\lambda. N_x$ | $N_x$    | $\lambda. N_x^s$ | $N_x^s$   | Age<br>$x$ . |
|--------------|----------------|---------|----------------|----------|------------------|-----------|--------------|
| 55           | 3.8943708      | 7840.99 | 4.9677069      | 92833.96 | 5.9451499        | 881353.03 | 55           |
| 56           | .8690137       | 7396.28 | .9316495       | 85437.68 | .9347819         | 860561.34 | 56           |
| 57           | .8431744       | 6969.06 | .8946960       | 78468.62 | .9240541         | 839564.58 | 57           |
| 58           | .8168261       | 6558.83 | .8567879       | 71909.79 | .9128226         | 818130.61 | 58           |
| 59           | .7899394       | 6165.09 | .8178607       | 65744.70 | .9009564         | 796079.45 | 59           |
| 60           | .7624818       | 5787.33 | .7778422       | 59957.32 | .8883365         | 773279.49 | 60           |
| 61           | .7344313       | 5425.39 | .7366508       | 54531.93 | .8748549         | 749643.72 | 61           |
| 62           | .7057559       | 5078.74 | .6941943       | 49453.19 | .8604121         | 725123.60 | 62           |
| 63           | .6762962       | 4745.66 | .6503806       | 44707.53 | .8446510         | 699279.78 | 63           |
| 64           | .6459045       | 4424.91 | .6051177       | 40282.62 | .8272370         | 671795.45 | 64           |
| 65           | .6144214       | 4115.49 | .5583141       | 36167.13 | .8078511         | 642467.40 | 65           |
| 66           | .5816808       | 3816.64 | .5098809       | 32350.49 | .7861814         | 611197.35 | 66           |
| 67           | .5475335       | 3528.04 | .4597309       | 28822.45 | .7619166         | 577985.12 | 67           |
| 68           | .5117842       | 3249.26 | .4077849       | 25573.19 | .7349291         | 543161.62 | 68           |
| 69           | .4742393       | 2980.16 | .3539745       | 22593.03 | .7050791         | 507083.07 | 69           |
| 70           | .4346944       | 2720.79 | .2982516       | 19872.46 | .6722133         | 470125.02 | 70           |
| 71           | .3929538       | 2471.46 | .2405642       | 17400.60 | .6361634         | 432676.59 | 71           |
| 72           | .3488109       | 2232.60 | .1809481       | 15168.69 | .5967432         | 395132.90 | 72           |
| 73           | .3024797       | 2006.69 | .1193021       | 13161.40 | .5538819         | 357999.07 | 73           |
| 74           | .2541607       | 1795.40 | 4.0556390      | 11366.82 | .5074517         | 321700.45 | 74           |
| 75           | .2040716       | 1599.82 | 3.9897377      | 9766.47  | .4572504         | 286582.99 | 75           |
| 76           | .1524230       | 1420.47 | .9214404       | 8345.27  | .4029736         | 252914.43 | 76           |
| 77           | .0994297       | 1257.27 | .8505310       | 7088.12  | .3441762         | 220890.03 | 77           |
| 78           | 3.0445879      | 1108.12 | .7767288       | 5980.38  | .2808662         | 190926.50 | 78           |
| 79           | 2.9873906      | 971.38  | .6998300       | 5009.91  | .2130611         | 163328.15 | 79           |
| 80           | .9273234       | 845.91  | .6194784       | 4163.69  | .1408219         | 138299.89 | 80           |
| 81           | .8637349       | 730.69  | .5356245       | 3432.61  | 5.0642990        | 115957.54 | 81           |
| 82           | .7963078       | 625.61  | .4481604       | 2806.47  | 4.9838142        | 96341.66  | 82           |
| 83           | .7254825       | 531.47  | .3570921       | 2275.58  | .8988679         | 79226.03  | 83           |
| 84           | .6518418       | 448.58  | .2621330       | 1828.66  | .8086938         | 64371.52  | 84           |
| 85           | .5759540       | 376.66  | .1613980       | 1450.10  | .7120851         | 51532.96  | 85           |
| 86           | .4984016       | 315.07  | 3.0553477      | 1135.92  | .6071364         | 40470.30  | 86           |
| 87           | .4198307       | 262.92  | 2.9407007      | 872.37   | .4907263         | 30954.68  | 87           |
| 88           | .3372008       | 217.37  | .8161020       | 654.79   | .3605641         | 22938.45  | 88           |
| 89           | .2474613       | 176.79  | .6788733       | 477.39   | .2139247         | 16365.33  | 89           |
| 90           | .1473355       | 140.39  | .5289039       | 337.99   | 4.0476152        | 11158.75  | 90           |
| 91           | 2.0333922      | 107.99  | .3612555       | 229.75   | 3.8579738        | 7210.64   | 91           |
| 92           | 1.9017236      | 79.75   | 2.1740016      | 149.28   | .6410048         | 4375.27   | 92           |
| 93           | .7503538       | 56.28   | 1.9730354      | 93.98    | .3919702         | 2465.87   | 93           |
| 94           | .5795659       | 37.98   | .7439016       | 55.45    | 3.1050297        | 1273.59   | 94           |
| 95           | .3882993       | 24.45   | .5047426       | 31.97    | 2.7713229        | 590.64    | 95           |
| 96           | 1.1750325      | 14.97   | 1.2224563      | 16.69    | 2.3805549        | 240.19    | 96           |
| 97           | 0.9388313      | 8.69    | 0.8796692      | 7.58     | 1.9394194        | 86.98     | 97           |
| 98           | .6611471       | 4.58    | 0.3180633      | 2.08     | 1.4230820        | 26.49     | 98           |
| 99           | 0.3180214      | 2.08    | 9.8864907      | 0.77     | 0.7664128        | 5.84      | 99           |
| 100          | 9.8877313      | 0.77    | ...            | 0.00     | 0.1986571        | 1.58      | 100          |



TABLE 19.

*Friendly Societies.—England and Wales.—Three Districts.—Four-and-half per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$    | $\lambda. N_x$ | $N_x$      | $\lambda. N_x^s$ | $N_x^s$    | Age<br>$x$ . |
|--------------|----------------|----------|----------------|------------|------------------|------------|--------------|
| 10           | 4.8088371      | 64392.77 | 6.0770022      | 1193994.47 | 6.2253650        | 1680251.55 | 10           |
| 11           | .7886337       | 61465.81 | .0540492       | 1132528.66 | .2177237         | 1650911.11 | 11           |
| 12           | .7684319       | 58672.14 | .0309463       | 1073856.52 | .2087507         | 1617151.49 | 12           |
| 13           | .7481575       | 55996.06 | 6.0076882      | 1017860.46 | .1987557         | 1580358.75 | 13           |
| 14           | .7277350       | 53423.82 | 5.9842737      | 964436.64  | .1880202         | 1541772.11 | 14           |
| 15           | .7070929       | 50943.98 | .9607051       | 913492.66  | .1768091         | 1502481.43 | 15           |
| 16           | .6861580       | 48546.51 | .9369891       | 864946.15  | .1653794         | 1463455.09 | 16           |
| 17           | .6648554       | 46222.71 | .9131372       | 818723.44  | .1539820         | 1425548.45 | 17           |
| 18           | .6432557       | 43980.05 | .8891579       | 774743.39  | .1426569         | 1388855.08 | 18           |
| 19           | .6214303       | 41824.46 | .8650560       | 732918.93  | .1314442         | 1353455.98 | 19           |
| 20           | .5994520       | 39760.51 | .8408325       | 693158.42  | .1203789         | 1319407.39 | 20           |
| 21           | .5773910       | 37791.23 | .8164847       | 655367.19  | .1094946         | 1286751.26 | 21           |
| 22           | .5553190       | 35918.57 | .7920053       | 619448.62  | .0988199         | 1255509.27 | 22           |
| 23           | .5332267       | 34137.11 | .7673870       | 585311.51  | .0883480         | 1225597.62 | 23           |
| 24           | .5111139       | 32442.47 | .7426223       | 552869.04  | .0780709         | 1196935.80 | 24           |
| 25           | .4889709       | 30829.81 | .7177032       | 522039.23  | .0679838         | 1169455.67 | 25           |
| 26           | .4667973       | 29295.25 | .6926213       | 492743.98  | .0580809         | 1143091.28 | 26           |
| 27           | .4445830       | 27834.47 | .6673684       | 464909.51  | .0483568         | 1117781.31 | 27           |
| 28           | .4223225       | 26443.71 | .6419358       | 438465.80  | .0388239         | 1093512.92 | 28           |
| 29           | .4000149       | 25119.72 | .6163138       | 413346.08  | .0294927         | 1070268.31 | 29           |
| 30           | .3776545       | 23859.13 | .5904929       | 389486.95  | .0204738         | 1048030.29 | 30           |
| 31           | .3552403       | 22658.98 | .5644624       | 366827.97  | .0114774         | 1026779.92 | 31           |
| 32           | .3327663       | 21516.24 | .5382114       | 345311.73  | 6.0028113        | 1006494.31 | 32           |
| 33           | .3102314       | 20428.26 | .5117276       | 324883.47  | 5.9943303        | 987029.74  | 33           |
| 34           | .2876342       | 19392.52 | .4849983       | 305490.95  | .9859910         | 968257.71  | 34           |
| 35           | .2649685       | 18406.38 | .4580098       | 287084.57  | .9777545         | 950067.62  | 35           |
| 36           | .2422327       | 17467.58 | .4307473       | 269616.99  | .9695843         | 932361.49  | 36           |
| 37           | .2194255       | 16573.93 | .4031944       | 253043.06  | .9614477         | 915056.20  | 37           |
| 38           | .1965347       | 15722.97 | .3753345       | 237320.09  | .9533147         | 898079.34  | 38           |
| 39           | .1735480       | 14912.45 | .3471497       | 222407.64  | .9451563         | 881366.09  | 39           |
| 40           | .1504579       | 14140.28 | .3186212       | 208267.36  | .9369493         | 864866.90  | 40           |
| 41           | .1272458       | 13404.35 | .2897294       | 194863.01  | .9286710         | 848537.47  | 41           |
| 42           | .1039032       | 12702.91 | .2604532       | 182160.10  | .9203026         | 832343.44  | 42           |
| 43           | .0804158       | 12034.16 | .2307705       | 170125.94  | .9118332         | 816268.82  | 43           |
| 44           | .0567686       | 11396.43 | .2006577       | 158729.51  | .9032548         | 800303.69  | 44           |
| 45           | .0329459       | 10788.12 | .1700897       | 147941.39  | .8945604         | 784441.20  | 45           |
| 46           | 4.0089368      | 10207.91 | .1390395       | 137733.48  | .8857453         | 768679.46  | 46           |
| 47           | 3.9847300      | 9654.50  | .1074778       | 128078.98  | .8768052         | 753017.68  | 47           |
| 48           | .9602845       | 9126.08  | .0753750       | 118952.90  | .8677101         | 737411.84  | 48           |
| 49           | .9355688       | 8621.23  | .0427002       | 110331.67  | .8584334         | 721827.43  | 49           |
| 50           | .9105496       | 8138.60  | 5.0094215      | 102193.07  | .8489529         | 706240.94  | 50           |
| 51           | .8851915       | 7677.00  | 4.9755056      | 94516.07   | .8392504         | 690637.91  | 51           |
| 52           | .8594625       | 7235.40  | .9409181       | 87280.67   | .8293116         | 675012.12  | 52           |
| 53           | .8333345       | 6812.94  | .9056217       | 80467.73   | .8191032         | 659330.58  | 53           |
| 54           | .8067896       | 6408.99  | .8695763       | 74058.74   | .8085975         | 643572.53  | 54           |
| 55           | 3.7798081      | 6022.93  | 4.8327376      | 68035.81   | 5.7977713        | 627727.75  | 55           |



TABLE 19—(continued).

*Friendly Societies.—England and Wales.—Three Districts.—Four-and-half per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$   | $\lambda. N_x$ | $N_x$    | $\lambda. N_x^s$ | $N_x^s$   | Age<br>$x$ . |
|--------------|----------------|---------|----------------|----------|------------------|-----------|--------------|
| 55           | 3.7798081      | 6022.93 | 4.8327376      | 68035.81 | 5.7977713        | 627727.75 | 55           |
| 56           | .7523681       | 5654.16 | .7950569       | 62381.65 | .7866067         | 611795.98 | 56           |
| 57           | .7244458       | 5302.07 | .7564808       | 57079.58 | .7750889         | 595784.06 | 57           |
| 58           | .6960146       | 4966.09 | .7169502       | 52113.49 | .7630661         | 579516.93 | 58           |
| 59           | .6670450       | 4645.63 | .6763996       | 47467.86 | .7504015         | 562861.46 | 59           |
| 60           | .6375044       | 4340.15 | .6347564       | 43127.71 | .7369711         | 545722.82 | 60           |
| 61           | .6073709       | 4049.22 | .5919377       | 39078.49 | .7226675         | 528040.91 | 61           |
| 62           | .5766126       | 3772.36 | .5478501       | 35306.13 | .7073872         | 509785.18 | 62           |
| 63           | .5450699       | 3508.08 | .5024005       | 31798.05 | .6907594         | 490636.00 | 63           |
| 64           | .5125952       | 3255.33 | .4554953       | 28542.72 | .6724384         | 470368.71 | 64           |
| 65           | .4790292       | 3013.21 | .4070425       | 25529.51 | .6520967         | 448845.32 | 65           |
| 66           | .4442056       | 2781.03 | .3569524       | 22748.48 | .6294163         | 426006.52 | 66           |
| 67           | .4079753       | 2558.44 | .3051372       | 20190.04 | .6040805         | 401865.28 | 67           |
| 68           | .3701431       | 2345.00 | .2515176       | 17845.04 | .5759656         | 376673.95 | 68           |
| 69           | .3305153       | 2140.50 | .1960252       | 15704.54 | .5449353         | 350699.58 | 69           |
| 70           | .2888874       | 1944.86 | .1386083       | 13759.68 | .5108389         | 324219.34 | 70           |
| 71           | .2450639       | 1758.18 | .0792355       | 12001.50 | .4735105         | 297516.13 | 71           |
| 72           | .1988380       | 1580.66 | 4.0179027      | 10420.84 | .4327658         | 270873.08 | 72           |
| 73           | .1504238       | 1413.92 | 3.9545763      | 9006.92  | .3885399         | 244646.98 | 73           |
| 74           | .1000219       | 1258.99 | .8891857       | 7747.93  | .3407086         | 219133.42 | 74           |
| 75           | 3.0478498      | 1116.48 | .8216085       | 6631.45  | .2890718         | 194568.17 | 75           |
| 76           | 2.9941182      | 986.55  | .7516563       | 5644.90  | .2333240         | 171129.14 | 76           |
| 77           | .9390420       | 869.04  | .6790516       | 4775.86  | .1730144         | 148941.40 | 77           |
| 78           | .8821170       | 762.28  | .6035319       | 4013.58  | .1081871         | 128280.83 | 78           |
| 79           | .8228370       | 665.02  | .5248581       | 3348.56  | 5.0287877        | 109342.16 | 79           |
| 80           | .7606869       | 576.35  | .4428262       | 2772.21  | 4.9649633        | 92249.33  | 80           |
| 81           | .6950154       | 495.47  | .3573134       | 2276.74  | .8868505         | 77063.82  | 81           |
| 82           | .6255053       | 422.19  | .2682286       | 1854.55  | .8047880         | 63795.21  | 82           |
| 83           | .5525971       | 356.94  | .1753987       | 1497.61  | .7182793         | 52273.23  | 83           |
| 84           | .4768734       | 299.83  | 3.0783770      | 1197.78  | .6265585         | 42321.25  | 84           |
| 85           | .3989026       | 250.55  | 2.9764554      | 947.23   | .5284158         | 33761.04  | 85           |
| 86           | .3192673       | 208.58  | .8684387       | 738.65   | .4219363         | 26420.21  | 86           |
| 87           | .2386134       | 173.23  | .7523712       | 565.42   | .3039767         | 20136.16  | 87           |
| 88           | .1539005       | 142.53  | .6262274       | 422.89   | .1722418         | 14867.63  | 88           |
| 89           | 2.0620782      | 115.37  | .4878734       | 307.52   | 4.0240023        | 10568.23  | 89           |
| 90           | 1.9598694      | 91.17   | .3351569       | 216.35   | 3.8560616        | 7178.96   | 90           |
| 91           | .8438431       | 69.80   | 2.1659858      | 146.55   | .6647548         | 4621.20   | 91           |
| 92           | .7100916       | 51.30   | 1.9786598      | 95.25    | .4460880         | 2793.11   | 92           |
| 93           | .5566388       | 36.03   | .7724684       | 59.22    | 3.1953239        | 1567.92   | 93           |
| 94           | .3837679       | 24.20   | .5443161       | 35.02    | 2.9066259        | 806.54    | 94           |
| 95           | 1.1904184      | 15.50   | .2904798       | 19.52    | .5711263         | 372.50    | 95           |
| 96           | 0.9750686      | 9.44    | 1.0034605      | 10.08    | 2.1785165        | 150.84    | 96           |
| 97           | .7367844       | 5.45    | 0.6655810      | 4.63     | 1.7355989        | 54.40     | 97           |
| 98           | .4570173       | 2.86    | 0.2479733      | 1.77     | 1.2177471        | 16.51     | 98           |
| 99           | 0.1118086      | 1.29    | 9.6812412      | 0.48     | 0.5599066        | 3.63      | 99           |
| 100          | 1.6794356      | 0.48    | ...            | 0.00     | 9.9912261        | 0.98      | 100          |



TABLE 20.

*Friendly Societies.—England and Wales.—Three Districts.—Five per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$    | $\lambda. N_x$ | $N_x$      | $\lambda. N_x^s$ | $N_x^s$    | Age<br>$x$ . |
|--------------|----------------|----------|----------------|------------|------------------|------------|--------------|
| 10           | 4.7881070      | 61391.33 | 6.0215511      | 1050875.09 | 6.1366873        | 1369894.81 | 10           |
| 11           | .7658306       | 58321.75 | 5.9967524      | 992553.34  | .1277493         | 1341990.21 | 11           |
| 12           | .7435558       | 55405.88 | .9718079       | 937147.46  | .1172831         | 1310035.58 | 12           |
| 13           | .7212084       | 52626.98 | .9467101       | 884520.48  | .1056407         | 1275375.83 | 13           |
| 14           | .6987129       | 49970.41 | .9214524       | 834550.07  | .0931411         | 1239199.28 | 14           |
| 15           | .6759978       | 47423.96 | .8960443       | 787126.11  | .0800988         | 1202538.07 | 15           |
| 16           | .6529898       | 44976.93 | .8704912       | 742149.18  | .0668092         | 1166296.92 | 16           |
| 17           | .6296142       | 42620.08 | .8448057       | 699529.10  | .0535637         | 1131263.19 | 17           |
| 18           | .6059415       | 40359.10 | .8189974       | 659170.00  | .0404094         | 1097512.25 | 18           |
| 19           | .5820431       | 38198.22 | .7930718       | 620971.78  | .0273932         | 1065106.85 | 19           |
| 20           | .5579918       | 36140.31 | .7670307       | 584831.47  | .0145567         | 1034086.17 | 20           |
| 21           | .5338578       | 34186.75 | .7408735       | 550644.72  | 6.0019395        | 1004475.81 | 21           |
| 22           | .5097128       | 32337.97 | .7145869       | 518306.75  | 5.9895755        | 976282.58  | 22           |
| 23           | .4855475       | 30587.75 | .6881697       | 487719.00  | .9774577         | 949418.40  | 23           |
| 24           | .4613617       | 28930.89 | .6616121       | 458788.11  | .9655777         | 923799.30  | 24           |
| 25           | .4371457       | 27361.87 | .6349065       | 431426.24  | .9539304         | 899353.41  | 25           |
| 26           | .4128991       | 25876.12 | .6080445       | 405550.12  | .9425100         | 876011.74  | 26           |
| 27           | .3886117       | 24468.75 | .5810178       | 381081.37  | .9313106         | 853710.31  | 27           |
| 28           | .3642782       | 23135.46 | .5538174       | 357945.91  | .9203469         | 832428.47  | 28           |
| 29           | .3398976       | 21872.46 | .5264342       | 336073.45  | .9096317         | 812141.49  | 29           |
| 30           | .3154642       | 20675.89 | .4988583       | 315397.56  | .8991776         | 792825.45  | 30           |
| 31           | .2909770       | 19542.36 | .4710792       | 295855.20  | .8889968         | 774455.18  | 31           |
| 32           | .2664300       | 18468.43 | .4430857       | 277386.77  | .8790973         | 757002.42  | 32           |
| 33           | .2418221       | 17451.07 | .4148659       | 259935.70  | .8694287         | 740335.79  | 33           |
| 34           | .2171519       | 16487.39 | .3864068       | 243448.31  | .8599417         | 724338.69  | 34           |
| 35           | .1924132       | 15574.46 | .3576945       | 227873.85  | .8505919         | 708911.32  | 35           |
| 36           | .1676044       | 14709.72 | .3287141       | 213164.13  | .8413381         | 693965.91  | 36           |
| 37           | .1427241       | 13890.70 | .2994494       | 199273.43  | .8321437         | 679428.41  | 37           |
| 38           | .1177603       | 13114.76 | .2698833       | 186158.67  | .8229745         | 665234.15  | 38           |
| 39           | .0927006       | 12379.43 | .2399979       | 173779.24  | .8137994         | 651327.39  | 39           |
| 40           | .0675375       | 11682.54 | .2097742       | 162096.70  | .8045920         | 637664.13  | 40           |
| 41           | .0422524       | 11021.80 | .1791923       | 151074.90  | .7953278         | 624205.84  | 41           |
| 42           | 4.0168368      | 10395.29 | .1482312       | 140679.61  | .7859860         | 610922.39  | 42           |
| 43           | 3.9912763      | 9801.13  | .1168683       | 130878.48  | .7765559         | 597799.98  | 43           |
| 44           | .9655562       | 9237.54  | .0850798       | 121640.94  | .7670288         | 584828.98  | 44           |
| 45           | .9396605       | 8702.83  | .0528405       | 112938.11  | .7573981         | 572002.77  | 45           |
| 46           | .9135784       | 8195.55  | 5.0201232      | 104742.56  | .7476594         | 559318.71  | 46           |
| 47           | .8872986       | 7714.34  | 4.9868981      | 97028.22   | .7378087         | 546775.11  | 47           |
| 48           | .8607800       | 7257.38  | .9531353       | 89770.84   | .7278143         | 534335.84  | 48           |
| 49           | .8339913       | 6823.25  | .9188038       | 82947.59   | .7176479         | 521972.80  | 49           |
| 50           | .8068991       | 6410.61  | .8838713       | 76536.98   | .7072865         | 509666.99  | 50           |
| 51           | .7794680       | 6018.22  | .8483046       | 70518.76   | .6967117         | 497406.78  | 51           |
| 52           | .7516660       | 5645.03  | .8120689       | 64873.73   | .6859093         | 485187.16  | 52           |
| 53           | .7234650       | 5290.11  | .7751269       | 59583.62   | .6748450         | 472982.34  | 53           |
| 54           | .6948472       | 4952.76  | .7374381       | 54630.86   | .6634902         | 460776.37  | 54           |
| 55           | 3.6657927      | 4632.26  | 4.6989578      | 49998.60   | 5.6518221        | 448561.66  | 55           |



TABLE 20—(continued).

*Friendly Societies.—England and Wales.—Three Districts.—Five per Cent.*

| Age<br>$x$ . | $\lambda. D_x$ | $D_x$   | $\lambda. N_x$ | $N_x$    | $\lambda. N_x^s$ | $N_x^s$   | Age<br>$x$ . |
|--------------|----------------|---------|----------------|----------|------------------|-----------|--------------|
| 55           | 3.6657927      | 4632.26 | 4.6989578      | 49998.60 | 5.6518221        | 448561.66 | 55           |
| 56           | .6362797       | 4327.93 | .6596374       | 45670.67 | .6398234         | 436338.38 | 56           |
| 57           | .6062844       | 4039.10 | .6194227       | 41631.57 | .6274807         | 424112.10 | 57           |
| 58           | .5757801       | 3765.13 | .5782545       | 37866.44 | .6146337         | 411750.09 | 58           |
| 59           | .5447373       | 3505.40 | .5360663       | 34361.04 | .6011396         | 399153.25 | 59           |
| 60           | .5131239       | 3259.30 | .4927847       | 31101.74 | .5868715         | 386252.70 | 60           |
| 61           | .4809174       | 3026.34 | .4483260       | 28075.40 | .5717165         | 373006.60 | 61           |
| 62           | .4480861       | 2805.99 | .4025952       | 25269.41 | .5555730         | 359395.75 | 62           |
| 63           | .4144704       | 2596.99 | .3554979       | 22672.42 | .5380541         | 345186.76 | 63           |
| 64           | .3799227       | 2398.41 | .3069396       | 20274.01 | .5188030         | 330219.73 | 64           |
| 65           | .3442837       | 2209.45 | .2568274       | 18064.56 | .4974836         | 314400.78 | 65           |
| 66           | .3073871       | 2029.49 | .2050709       | 16035.07 | .4737715         | 297694.99 | 66           |
| 67           | .2690838       | 1858.16 | .1515815       | 14176.91 | .4473534         | 280120.59 | 67           |
| 68           | .2291786       | 1695.03 | .0962800       | 12481.88 | .4180842         | 261869.08 | 68           |
| 69           | .1874777       | 1539.85 | 4.0390979      | 10942.03 | .3858562         | 243139.86 | 69           |
| 70           | .1437768       | 1392.44 | 3.9799847      | 9549.59  | .3505132         | 224136.79 | 70           |
| 71           | .0978803       | 1252.80 | .9189101       | 8296.79  | .3118915         | 205064.96 | 71           |
| 72           | 3.0495814      | 1120.94 | .8558734       | 7175.85  | .2698087         | 186126.71 | 72           |
| 73           | 2.9990942      | 997.92  | .7908430       | 6177.93  | .2242056         | 167573.61 | 73           |
| 74           | .9466193       | 884.34  | .7237503       | 5293.59  | .1749621         | 149610.53 | 74           |
| 75           | .8923742       | 780.50  | .6544740       | 4513.09  | .1218797         | 132397.47 | 75           |
| 76           | .8365696       | 686.39  | .5828244       | 3826.70  | .0646517         | 116051.77 | 76           |
| 77           | .7794204       | 601.76  | .5085217       | 3224.94  | 5.0028240        | 100652.37 | 77           |
| 78           | .7204226       | 525.32  | .4313026       | 2699.62  | 4.9364192        | 86381.19  | 78           |
| 79           | .6590693       | 456.11  | .3509280       | 2243.51  | .8654694         | 73361.70  | 79           |
| 80           | .5948462       | 393.41  | .2671952       | 1850.10  | .7900534         | 61667.09  | 80           |
| 81           | .5271017       | 336.59  | .1799853       | 1513.51  | .7103452         | 51326.92  | 81           |
| 82           | .4555186       | 285.44  | 3.0892231      | 1228.07  | .6266999         | 42335.03  | 82           |
| 83           | .3805374       | 240.18  | 2.9947086      | 987.89   | .5386235         | 34563.98  | 83           |
| 84           | .3027407       | 200.79  | .8960290       | 787.10   | .4453517         | 27883.78  | 84           |
| 85           | .2226969       | 166.99  | .7924687       | 620.11   | .3456709         | 22165.16  | 85           |
| 86           | .1409886       | 138.35  | .6828307       | 481.76   | .2376569         | 17284.50  | 86           |
| 87           | 2.0582617      | 114.36  | .5651392       | 367.40   | 4.1181576        | 13126.76  | 87           |
| 88           | 1.9714758      | 93.64   | .4373700       | 273.76   | 3.9848503        | 9657.18   | 88           |
| 89           | .8775804       | 75.44   | .2973665       | 198.32   | .8350117         | 6839.30   | 89           |
| 90           | .7732986       | 59.33   | 2.1429836      | 138.99   | .6654412         | 4628.51   | 90           |
| 91           | .6551993       | 45.21   | 1.9721102      | 93.78    | .4724712         | 2968.05   | 91           |
| 92           | .5193748       | 33.07   | .7832602       | 60.71    | 3.2521075        | 1786.93   | 92           |
| 93           | .3638490       | 23.11   | .5751878       | 37.60    | 2.9996133        | 999.11    | 93           |
| 94           | 1.1889051      | 15.45   | .3453737       | 22.15    | .7091512         | 511.86    | 94           |
| 95           | 0.9934826      | 9.85    | 1.0899051      | 12.30    | 2.3718434        | 235.42    | 95           |
| 96           | .7760598       | 5.97    | 0.8014037      | 6.33     | 1.9774492        | 94.94     | 96           |
| 97           | .5357026       | 3.43    | .4623980       | 2.90     | .5327544         | 34.10     | 97           |
| 98           | 0.2538625      | 1.79    | 0.0453230      | 1.11     | 1.0132587        | 10.31     | 98           |
| 99           | 1.9065808      | .81     | 9.4771213      | 0.30     | 0.3541084        | 2.26      | 99           |
| 100          | 1.4721347      | .30     | ...            | 0.00     | 9.7853298        | 0.61      | 100          |



The use of the five Table **16**, **17**, **18**, **19**, and **20**, immediately preceding will be sufficiently understood from the explanations given in pp. 495-6, 532-3, and pp. 544-9 *ante*. It will be observed that by the aid of column N<sup>s</sup> the values of Sickness Benefits are determined with the same facility as ordinary questions of life contingencies are solved by means of the usual N columns. Examples and formula will be found in page 496 *ante*. The results in Tables A H to A N inclusive, and in Tables A Q to A S inclusive, were determined by the ordinary method of calculating annuities, and not by the Commutation System of Barrett, on which the five preceding Tables were constructed.

The formula by which the values of the Sickness Benefits in Tables A G to A S inclusive were formed are given in page 486. The Commutation System however, as appears from the following examples, offers much greater facilities for the solution of the more complicated questions.

*The following Examples shew the differences between the values arrived at by the two series of Tables.*

|                                                    |   |                                                                                                                                                                                                                                              |
|----------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Immediate Annuity.—Age 40 .                        | { | $\lambda.N_{40} = 5.6544931$<br>$\lambda.D_{40} = 4.4016205$<br><hr/> $1.2528726 = 17.90081 = \text{RESULT BY TABLE } \mathbf{16}.$<br>$17.90117 = \text{Do. TABLE A H.}$                                                                    |
| Deferred Annuity.—Age 40 .                         | { | $\lambda.N_{70} = 4.6206303$<br>$\lambda.D_{40} = 4.4016205$<br><hr/> $0.2190098 = 1.65581 = \text{RESULT BY TABLE } \mathbf{16}.$<br>$1.65581 = \text{Do. TABLE A I.}$                                                                      |
| Temporary Annuity.—Age 40 .                        | { | $N_{40} = 451329$<br>$N_{70} = 41747$<br><hr/> $409582\lambda = 5.6123408$<br>$\lambda D_{40} = 4.4016205$<br><hr/> $1.2107203 = 16.24502 = \text{RESULT BY TABLE } \mathbf{16}.$<br>$16.24536 = \text{Do. TABLE A K.}$                      |
| Sum at Death.—Single Premium.—<br>Age 40 . . . . . | { | $\lambda.N_{39} = 5.6781009$<br>$\lambda.D_{40} = 4.4016205$<br><hr/> $1.2764804 = 18.90081$<br>$(1-r) = .02913$<br><hr/> $.55058$<br>$1.00000$<br><hr/> $.44942 = \text{RESULT BY TABLE } \mathbf{16}.$<br>$.44948 = \text{Do. TABLE A L.}$ |



|                                                                                           |   |                                                                |                                                    |
|-------------------------------------------------------------------------------------------|---|----------------------------------------------------------------|----------------------------------------------------|
| Sum at Death.—Annual Premium.—<br>Age 40 . . . . .                                        | { | $\lambda.D_{40} = 4.4016205$                                   |                                                    |
|                                                                                           |   | $\lambda.N_{39} = 5.6781009$                                   |                                                    |
|                                                                                           |   | $8.7235196 = .05291$                                           |                                                    |
|                                                                                           |   | $(1-r) = .02913$                                               |                                                    |
|                                                                                           |   |                                                                | $.02378 = \text{RESULT BY TABLE 16.}$              |
|                                                                                           |   |                                                                | $.02378 = \text{Do. TABLE A M.}$                   |
| Sum at Death.—Temporary Annual<br>Premium, until 70.—Age 40 . . . . .                     | { | $\frac{A_{40}}{1 + {}_{30}a_{(40)}} = \frac{.44942}{17.24502}$ | $= .02606 = \text{RESULT BY TABLE 16.}$            |
|                                                                                           |   |                                                                | $.02606 = \text{Do. TABLE A N.}$                   |
|                                                                                           |   |                                                                |                                                    |
|                                                                                           |   |                                                                |                                                    |
| Sickness, until Age 70.—Single<br>Premium.—Age 40 . . . . .                               | { | $N_{40}^s = 2228516$                                           |                                                    |
|                                                                                           |   | $N_{70}^s = 995814$                                            |                                                    |
|                                                                                           |   | $1232702 \lambda = 6.0908581$                                  |                                                    |
|                                                                                           |   | $\lambda.D_{40} = 4.4016205$                                   |                                                    |
|                                                                                           |   | $1.6892376 = 48.89198 = \text{RESULT BY TABLE 16.}$            |                                                    |
|                                                                                           |   | $48.83092 = \text{Do. TABLE A Q.}$                             |                                                    |
| Sickness, until Age 70.—Temporary<br>Annual Premium.—Age 40 . . . . .                     | { | $N_{40}^s = 2228516$                                           |                                                    |
|                                                                                           |   | $N_{70}^s = 995814$                                            |                                                    |
|                                                                                           |   | $1232702 \lambda = 6.0908581$                                  |                                                    |
|                                                                                           |   | $N_{39} = 476542$                                              |                                                    |
|                                                                                           |   | $N_{69} = 47098$                                               |                                                    |
|                                                                                           |   | $429444 \lambda = 5.6329065$                                   |                                                    |
|                                                                                           |   |                                                                | $0.4579516 = 2.87046 = \text{RESULT BY TABLE 16.}$ |
|                                                                                           |   |                                                                | $2.83154 = \text{Do. TABLE A R.}$                  |
| Sickness.—Whole of Life.—Single<br>Premium.—Age 40 . . . . .                              | { | $\lambda.N_{40}^s = 6.3480157$                                 |                                                    |
|                                                                                           |   | $\lambda.D_{40} = 4.4016205$                                   |                                                    |
|                                                                                           |   | $1.9463952 = 88.38839 = \text{RESULT BY TABLE 16.}$            |                                                    |
|                                                                                           |   | $88.33321 = \text{Do. TABLE A S.}$                             |                                                    |
| Sickness.—Whole of Life.—Annual<br>Premium.—Age 40 . . . . .                              | { | $\lambda.N_{40}^s = 6.3480157$                                 |                                                    |
|                                                                                           |   | $\lambda.N_{39} = 5.6781009$                                   |                                                    |
|                                                                                           |   | $0.6699148 = 4.67643 = \text{RESULT BY TABLE 16.}$             |                                                    |
|                                                                                           |   | $4.67342 = \text{Do. TABLE A S.}$                              |                                                    |
| Sickness.—Whole of Life.—Tempo-<br>rary Annual Premium, until Age<br>70.—Age 40 . . . . . | { | $\lambda.N_{40}^s = 6.3480157$                                 |                                                    |
|                                                                                           |   | $\lambda.(N_{39} - N_{69}) = 5.6329065$                        |                                                    |
|                                                                                           |   | $0.7151092 = 5.18931 = \text{RESULT BY TABLE 16.}$             |                                                    |
|                                                                                           |   | $5.12214 = \text{Do. TABLE A S.}$                              |                                                    |



The Tables in pp. 470-80 *ante* are all calculated at three per cent. interest, but by the five tables in pp. 582-91 questions may be solved at not only 3 but also  $3\frac{1}{2}$ , 4,  $4\frac{1}{2}$ , and 5 per cent. interest. Although so high a rate as 5 per cent. is seldom realized by Friendly or Benefit Societies still there are a few instances, such as the Society in connection with Mr. Beaumont's Lead Mines, which is under the guidance of Mr. Sopwith, so favourably known in scientific and philanthropic circles, there is the Society formed by the workmen on the London and South-Western Railway and others, in all of which the employers guarantee this high rate of interest. There is also the likelihood at present of other extensive employers granting similar encouragement to the formation of Friendly Societies amongst their workmen, and in every such instance the present tables will be found highly useful as well as important in the solution of questions of a merely curious and speculative character.

It was remarked in page 544 *ante*, that whenever occasion arose for the valuation of Life Contingencies at other rates of interest than those on which the preceding Tables are calculated, it could be done by a simple mode of approximation. In Mr. Thomson's Actuarial Tables, page 13, a method is suggested of adding the successive logarithmic differences between the known and the required rate of interest to the logarithms of the successive values of temporary annuities from the given age to the extreme of the Table, and then affecting the summation of the natural numbers of the results. For short period annuities, whether deferred or immediate, and with the aid of Mr. Thomson's Table IV, the plan is both simple and convenient, but for whole life immediate annuities, except at very advanced ages, the method is very tedious and irksome. The following mode of approximation, the demonstration of which is given in a very elegant form by Mr. Bullen in the "Post Magazine" for November 16th, 1850, will be found exceedingly convenient and useful in every case in which a table has been formed by the Commutation System at only one rate of interest, and a ready means is required by which to determine the corresponding values of annuities at other rates of interest.

In order to shew its practical utility and the extent to which the results arrived at by such means of approximation may be relied on, let it be assumed that of the series of ten Tables, 2 to 11 inclusive, pp. 534-43, only one had been actually constructed, namely, that for 5 per cent., and that it is required to find by approximation the values of annuities according to the rates of interest on which each of the remaining nine Tables of the series was calculated. If this were done and the results compared with the values obtained by direct calculation, it would enable any one to judge how far the method is applicable for the purpose proposed.

Table 6, page 538, having been formed,



Let  $r$  = Rate of interest on which the Commutation Table has been formed,

$r'$  = Rate of interest for which the value of the Annuity is required. Also let

$a_x$  = Value of an Annuity of £.1 at age  $x$ , according to the Commutation Table which has been actually constructed, and

$a'_x$  = Corresponding value of an Annuity of £.1 at age  $x$  for the required rate of interest.

Then if the summation of Column N in the Commutation Table which has been formed be continued in another series of Columns, so that

$$^1N_x = \Sigma N_x$$

$$^2N_x = \Sigma ^1N_{x+1}$$

$$^3N_x = \Sigma ^2N_{x+1}$$

$$^4N_x = \Sigma ^3N_{x+1} \text{ and}$$

$$^nN_x = \Sigma ^{n-1}N_{x+1} \text{ then will}$$

$$a'_x = a_x - \frac{^1N_x}{D_x} \cdot k + \frac{^2N_x}{D_x} \cdot k^2 - \frac{^3N_x}{D_x} \cdot k^3 + \frac{^4N_x}{D_x} \cdot k^4 \text{ \&c. \&c. . . . (1)}$$

$$\text{In which } k = \frac{r' - r}{1 + r'}$$

If, however, in the equation we make

$$\frac{^1N_x}{D_x} = A_x$$

$$\frac{^2N_x}{D_x} = B_x$$

$$\frac{^3N_x}{D_x} = C_x, \text{ \&c. \&c. \&c. then will}$$

$$a'_x = a_x - A_x \cdot k + B_x \cdot k^2 - C_x \cdot k^3 + D_x \cdot k^4 - \text{\&c. \&c. . . . . (2)}$$

As the quantity  $k$  will always be a very small fraction, and therefore, as in page 575, rapidly converge, more than four terms will seldom be required in the series.

The following Abstract will shew the manner in which the quantities  $^1N_x$ ,  $^2N_x$ ,  $^3N_x$ , &c. &c. are derived from Table 6, page 538.



Abstract showing the Process of Finding the Coefficients  ${}^1N_x$ ,  ${}^2N_x$ ,  ${}^3N_x$ , &c. &c., from TABLE 6.

| Age<br>$x$ | From Table 6.           |                         | ${}^1N_x$                | ${}^2N_x$                 | ${}^3N_x$                  | ${}^4N_x$                   |
|------------|-------------------------|-------------------------|--------------------------|---------------------------|----------------------------|-----------------------------|
|            | $D_x$<br>$\lambda. D_x$ | $N_x$<br>$\lambda. N_x$ | $\lambda. {}^1N_x$       | $\lambda. {}^2N_x$        | $\lambda. {}^3N_x$         | $\lambda. {}^4N_x$          |
| 10         | 61391.32<br>4.7881070   | 1008559.17<br>6.0037014 | 15924128.15<br>7.2020557 | 209761198.25<br>8.3217252 | 2429628771.74<br>9.3855400 | 24782505461.14<br>0.3941454 |
| 11         | 58005.45<br>.7634688    | 950553.72<br>5.9779767  | 14915568.98<br>.1736399  | 194845629.27<br>.2896906  | 2234783142.47<br>.3492353  | 22547722318.67<br>.3531026  |
| 12         | 54855.72<br>.7392219    | 895698.00<br>.9521616   | 13965015.26<br>.1450415  | 180880614.01<br>.2573919  | 2053902528.46<br>.3125799  | 20493819790.21<br>.3116229  |
| 13         | 51912.63<br>.7152730    | 843785.37<br>.9262320   | 13069317.26<br>.1162531  | 167811296.75<br>.2248212  | 1886091231.71<br>.2755626  | 18607728558.50<br>.2696934  |
| 14         | 49149.68<br>.6915207    | 794635.69<br>.9001681   | 12225531.89<br>.0872678  | 155585764.86<br>.1919700  | 1730505466.85<br>.2381729  | 16877223091.65<br>.2273009  |
| 15         | 46542.25<br>.6678474    | 748093.44<br>.8739558   | 11430896.20<br>.0580803  | 144154868.66<br>.1588293  | 1586350598.19<br>.2003993  | 15290872493.46<br>.1844322  |
| 16         | 44068.50<br>.6441282    | 704024.94<br>.8475881   | 10682802.76<br>7.0286852 | 133472065.90<br>.1253905  | 1452878532.29<br>.1622294  | 13837993961.17<br>.1410730  |
| 17         | 41709.09<br>.6202307    | 662315.85<br>.8210652   | 9978777.82<br>6.9990773  | 123493288.08<br>.0916435  | 1329385244.21<br>.1236508  | 12508608716.96<br>.0972091  |
| 18         | 39458.68<br>.5961425    | 622857.17<br>.7943884   | 9316461.97<br>.9692510   | 114176826.11<br>.0575780  | 1215208418.10<br>.0846507  | 11293400298.86<br>.0528247  |
| 19         | 37313.36<br>4.5718643   | 585543.81<br>5.7675594  | 8693604.80<br>6.9392000  | 105483221.31<br>8.0231833 | 1109725196.79<br>9.0452155 | 10183675102.07<br>0.0079047 |
| 97         | 1.241244<br>0.0938571   | 1.8086132<br>0.2573456  | 4.2239816<br>0.6257220   | 5.2048059<br>0.7164045    | 5.3947477<br>0.7319711     | 4.4498049<br>0.6483410      |
| 98         | .7461716<br>9.8728387   | 1.0624416<br>0.0263052  | 2.4153686<br>.3829835    | 2.7894373<br>0.4455168    | 2.6053104<br>.4158594      | 1.8444945<br>0.2658775      |
| 99         | .4471440<br>.6504474    | .6152976<br>9.7890852   | 1.3529270<br>0.1312744   | 1.4365103<br>0.1573086    | 1.1688001<br>0.0677402     | .6756944<br>9.8297504       |
| 100        | .2661571<br>.4251381    | .3491405<br>.5430002    | .7376294<br>9.8678387    | .6988809<br>9.8444032     | .4699192<br>9.6720232      | .2057752<br>9.3133931       |
| 101        | .1520898<br>9.1821001   | .1970507<br>.2945780    | .3884889<br>.5893787     | .3103920<br>.4919105      | .1595272<br>9.2028346      | .0462480<br>8.6650930       |
| 102        | .0896675<br>8.9526349   | .1073832<br>9.0309363   | .1914382<br>9.2820287    | .1189538<br>9.0753783     | .0405734<br>8.6082414      | .0056746<br>7.7539353       |
| 103        | .0525524<br>.7205922    | .0548308<br>8.7390246   | .0840550<br>8.9245636    | .0348988<br>8.5428104     | .0056746<br>7.7539343      |                             |
| 104        | .0312812<br>.4952829    | .0235496<br>8.3719902   | .0292242<br>8.4657427    | .0056746<br>7.7539343     |                            |                             |
| 105        | .0178750<br>8.2522449   | .0056746<br>7.7539343   | .0056746<br>7.7539343    |                           |                            |                             |
| 106        | .0056746<br>7.7539343   |                         |                          |                           |                            |                             |

If from the logs. of the above coefficients  ${}^1N_x$ ,  ${}^2N_x$ ,  ${}^3N_x$ , &c. be subtracted the corresponding  $\lambda. D_x$  there will be produced  $\lambda. A_x$ ,  $\lambda. B_x$ ,  $\lambda. C_x$ , and  $\lambda. D_x$ , which form the fourth, fifth, sixth, and seventh columns of Table 21, and afford a ready means of solving Equation (2) preceding.



It will be observed that, for the same rate of interest,  $k$  is constant for every age in the Table, and as the logs. of the first four powers of  $k$  may be written on a slip of paper, so as to cover precisely the spaces occupied by the fourth, fifth, sixth, and seventh columns of Table **21**, it will be easy to write down by inspection the sum of the logs. of both factors in each term of Equation (2), namely,

$$\lambda.A_x.k, \lambda.B_x.k^2, \lambda.C_x.k^3, \text{ and } \lambda.D_x.k^4$$

without writing the log. of each factor separately, and by this means the value of the annuity  $a'_x$  is speedily obtained. For example, in the case now under consideration,

$r = .05$ , and in order to find the values of Annuities at Six per Cent.

$$\frac{r' - r}{1 + r'} = \frac{.06 - .05}{1 + .06} = \frac{1}{106} = .0094340 = k \text{ which is constant for finding all values at Six per Cent. In like manner will}$$

$$\frac{r' - r}{1 + r'} = \frac{.07 - .05}{1 + .07} = \frac{2}{107} = .0186916 = k \text{ at Seven per Cent., and which is of course constant, and in a similar manner for any other rate of interest, say Ten per Cent.}$$

$$\frac{r' - r}{1 + r'} = \frac{.10 - .05}{1 + .10} = \frac{5}{110} = .0454545 = k \text{ at Ten per Cent., and is constant for that rate of interest.}$$

If in order, therefore, to avoid writing the logs. of both factors in each member of Equation (2), the logs. of the first four powers of  $k$  for each difference in the rate of interest were previously prepared and neatly written on slips of paper, so that they might be placed exactly superincumbent on the columns  $\lambda.A_x$ ,  $\lambda.B_x$ ,  $\lambda.C_x$ , and  $\lambda.D_x$  of Table **21**, addition may be performed by inspection, and the sum of the logs. of both factors written down at once, by which the values of Annuities, at any rate of interest, are obtained with little more trouble than that required to find them directly from a Commutation Table constructed for the particular rate of interest.

The following logs., as arranged in horizontal lines, will be constant for all ages, when a Commutation Table has been calculated at Five per Cent., and it is required to derive from it the values of corresponding Annuities at

|    |                              | $\lambda.k$ | $\lambda.k^2$ | $\lambda.k^3$ | $\lambda.k^4$ |
|----|------------------------------|-------------|---------------|---------------|---------------|
| 3  | per Cent. $k = .0194175$ and | 8.2881933   | 6.5763866     | 4.8645799     | 3.1527732     |
| 3½ | „ $k = .0144928$ „           | 8.1611523   | 6.3223046     | 4.4834569     | 2.6446092     |
| 4  | „ $k = .0096154$ „           | 7.9829674   | 5.9659348     | 3.9489022     | 1.9318696     |
| 4½ | „ $k = .0047847$ „           | 7.6798547   | 5.3597094     | 3.0395641     | 0.7194188     |
| 6  | „ $k = .0094340$ „           | 7.9746942   | 5.9493884     | 3.9240826     | 1.8987768     |
| 7  | „ $k = .0186916$ „           | 8.2716462   | 6.5432924     | 4.8149386     | 3.0865848     |
| 8  | „ $k = .0277778$ „           | 8.4436975   | 6.8873950     | 5.3310925     | 3.7747900     |
| 9  | „ $k = .0366972$ „           | 8.5646335   | 7.1292670     | 5.6939005     | 4.2585340     |
| 10 | „ $k = .0454545$ „           | 8.6575773   | 7.3151546     | 5.9727319     | 4.6303092     |



TABLE 21.

| Age | $a_x$    | Table 6.<br>$\lambda.N_x - \lambda.D_x$<br>$= \lambda.a_x$ | $\lambda.A_x$ | $\lambda.B_x$ | $\lambda.C_x$ | $\lambda.D_x$ | Age |
|-----|----------|------------------------------------------------------------|---------------|---------------|---------------|---------------|-----|
| 10  | 16.42837 | 1.2155944                                                  | 2.4139487     | 3.5336182     | 4.5974330     | 5.6060384     | 10  |
| 11  | 16.38732 | .2145079                                                   | .4101711      | .5262218      | .5857665      | .5896338      | 11  |
| 12  | 16.32825 | .2129397                                                   | .4058196      | .5181700      | .5733580      | .5724010      | 12  |
| 13  | 16.25395 | .2109590                                                   | .4009801      | .5095482      | .5602896      | .5544204      | 13  |
| 14  | 16.16767 | .2086474                                                   | .3957471      | .5004493      | .5466522      | .5357802      | 14  |
| 15  | 16.07342 | .2061084                                                   | .3902329      | .4909819      | .5325519      | .5165848      | 15  |
| 16  | 15.97570 | .2034599                                                   | .3845570      | .4812623      | .5181012      | .4969448      | 16  |
| 17  | 15.87942 | .2008345                                                   | .3788466      | .4714128      | .5034201      | .4769784      | 17  |
| 18  | 15.78505 | .1982459                                                   | .3731185      | .4614355      | .4885082      | .4567322      | 18  |
| 19  | 15.69260 | .1956951                                                   | .3673357      | .4513190      | .4733512      | .4360404      | 19  |
| 20  | 15.60154 | .1931675                                                   | .3615060      | .4410373      | .4579197      | .4150210      | 20  |
| 21  | 15.51113 | .1906432                                                   | .3555928      | .4305583      | .4421798      | .3935885      | 21  |
| 22  | 15.42055 | .1881001                                                   | .3495713      | .4198499      | .4260959      | .3717045      | 22  |
| 23  | 15.32954 | .1855290                                                   | .3434142      | .4088920      | .4096455      | .3493443      | 23  |
| 24  | 15.23827 | .1829358                                                   | .3371317      | .3976787      | .3928197      | .3264967      | 24  |
| 25  | 15.14683 | .1803216                                                   | .3307129      | .3861987      | .3756045      | .3031453      | 25  |
| 26  | 15.05453 | .1776670                                                   | .3241303      | .3744204      | .3579658      | .2792533      | 26  |
| 27  | 14.96047 | .1749453                                                   | .3173502      | .3623064      | .3398629      | .2547778      | 27  |
| 28  | 14.86408 | .1721380                                                   | .3103472      | .3498276      | .3212638      | .2296836      | 28  |
| 29  | 14.76468 | .1692240                                                   | .3030945      | .3369537      | .3021351      | .2039347      | 29  |
| 30  | 14.66122 | .1661701                                                   | .2955540      | .3236420      | .2824320      | .1774832      | 30  |
| 31  | 14.55347 | .1629665                                                   | .2877113      | .3098754      | .2621326      | .1502948      | 31  |
| 32  | 14.44118 | .1596028                                                   | .2795514      | .2956344      | .2412152      | .1223741      | 32  |
| 33  | 14.32391 | .1560616                                                   | .2710529      | .2808940      | .2196510      | .0936593      | 33  |
| 34  | 14.20174 | .1523414                                                   | .2622096      | .2656441      | .1974259      | .0641431      | 34  |
| 35  | 14.07437 | .1484290                                                   | .2530040      | .2498626      | .1745148      | .0337966      | 35  |
| 36  | 13.94171 | .1443158                                                   | .2434229      | .2335327      | .1508963      | .5.0025955    | 36  |
| 37  | 13.80361 | .1399927                                                   | .2334532      | .2166355      | .1265484      | .4.9705134    | 37  |
| 38  | 13.65996 | .1354494                                                   | .2230798      | .1991526      | .1014478      | .9375238      | 38  |
| 39  | 13.51080 | .1306811                                                   | .2122933      | .1810686      | .0755748      | .9036028      | 39  |
| 40  | 13.35638 | .1256888                                                   | .2010889      | .1623743      | .0489164      | .8687331      | 40  |
| 41  | 13.19621 | .1204493                                                   | .1894388      | .1430361      | .4.0214338    | .8328720      | 41  |
| 42  | 13.03073 | .1149685                                                   | .1773423      | .1230479      | 3.9931160     | .7960045      | 42  |
| 43  | 12.85960 | .1092274                                                   | .1647753      | .1023797      | .9639290      | .7580915      | 43  |
| 44  | 12.68308 | .1032248                                                   | .1517294      | .0810176      | .9338533      | .7191091      | 44  |
| 45  | 12.50107 | .0969472                                                   | .1381860      | .0589357      | .9028575      | .6790211      | 45  |
| 46  | 12.31343 | .0903789                                                   | .1241195      | .0361054      | .8709078      | .6377890      | 46  |
| 47  | 12.11984 | .0834968                                                   | .1095037      | 3.0124909     | .8379632      | .5953663      | 47  |
| 48  | 11.92034 | .0762884                                                   | .0943189      | 2.9880674     | .8039925      | .5517172      | 48  |
| 49  | 11.71476 | .0687334                                                   | .0785392      | .9628020      | .7689571      | .5067971      | 49  |
| 50  | 11.50314 | .0608164                                                   | .0621435      | .9366668      | .7328231      | .4605669      | 50  |
| 51  | 11.28531 | .0525134                                                   | .0451027      | .9096256      | .6955475      | .4129779      | 51  |
| 52  | 11.06203 | .0438348                                                   | .0274211      | .8816745      | .6571202      | .3640144      | 52  |
| 53  | 10.83319 | .0347564                                                   | 2.0090681     | .8527756      | .6174963      | .3136255      | 53  |
| 54  | 10.59924 | .0252746                                                   | 1.9900332     | .8229102      | .5766500      | .2617799      | 54  |
| 55  | 10.36048 | .0153799                                                   | .9702995      | .7920524      | .5345491      | .2084386      | 55  |
| 56  | 10.11705 | 1.0050541                                                  | .9498414      | .7601688      | .4911520      | .1535550      | 56  |
| 57  | 9.86858  | 0.9942548                                                  | 1.9286111     | 2.7252027     | 3.4463953     | .4.0970592    | 57  |



TABLE 21—(continued).

| Age | $a_x$   | Table 6.<br>$\lambda.N_x - \lambda.D_x$<br>$= \lambda.a_x$ | $\lambda.A$ | $\lambda.B_x$ | $\lambda.C_x$ | $\lambda.D_x$ | Age |
|-----|---------|------------------------------------------------------------|-------------|---------------|---------------|---------------|-----|
| 58  | 9.61615 | 0.9830010                                                  | 1.9066198   | 2.6931561     | 3.4002734     | 4.0389399     | 58  |
| 59  | 9.35890 | .9712246                                                   | .8837953    | .6579483      | .3526983      | 3.9791034     | 59  |
| 60  | 9.09779 | .9589357                                                   | .8601427    | .6215748      | .3036583      | .9175321      | 60  |
| 61  | 8.83278 | .9460973                                                   | .8356212    | .5839861      | .2530960      | .8541639      | 61  |
| 62  | 8.56516 | .9327356                                                   | .8102515    | .5451918      | .2010144      | .7889969      | 62  |
| 63  | 8.29475 | .9188032                                                   | .7839819    | .5051314      | .1473458      | .7219592      | 63  |
| 64  | 8.02288 | .9043304                                                   | .7568354    | .4638171      | .0920964      | .6530532      | 64  |
| 65  | 7.74943 | .8892698                                                   | .7287606    | .4211882      | 3.0352001     | .5822104      | 65  |
| 66  | 7.47569 | .8736515                                                   | .6997774    | .3772556      | 2.9766638     | .5094353      | 66  |
| 67  | 7.20090 | .8573870                                                   | .6697965    | .3319228      | .9163873      | .4346274      | 67  |
| 68  | 6.92642 | .8405085                                                   | .6388355    | .2852009      | .8543801      | .3577957      | 68  |
| 69  | 6.65108 | .8228918                                                   | .6068051    | .2369974      | .7905494      | .2788486      | 69  |
| 70  | 6.37672 | .8045974                                                   | .5737386    | .1873435      | .7249270      | .1978206      | 70  |
| 71  | 6.10290 | .7855361                                                   | .5395710    | .1361749      | .6574517      | .1146538      | 71  |
| 72  | 5.83124 | .7657680                                                   | .5043708    | .0835634      | .5881993      | 3.0294302     | 72  |
| 73  | 5.56173 | .7452101                                                   | .4680791    | 2.0294568     | .5171235      | 2.9411095     | 73  |
| 74  | 5.29595 | .7239440                                                   | .4307952    | 1.9739636     | .4443400      | .8528174      | 74  |
| 75  | 5.03308 | .7018336                                                   | .3924282    | .9170068      | .3697802      | .7614972      | 75  |
| 76  | 4.77578 | .6790443                                                   | .3531761    | .8587965      | .2936631      | .6683849      | 76  |
| 77  | 4.52377 | .6555003                                                   | .3130194    | .7993275      | .2159951      | .5735084      | 77  |
| 78  | 4.28008 | .6314516                                                   | .2722374    | .7388873      | .1370790      | .4772006      | 78  |
| 79  | 4.04512 | .6069316                                                   | .2308958    | .6775484      | 2.0570108     | .3795962      | 79  |
| 80  | 3.82101 | .5821784                                                   | .1892265    | .6155490      | 1.9760633     | .2810150      | 80  |
| 81  | 3.60582 | .5570040                                                   | .1470663    | .5527472      | .8941437      | .1814188      | 81  |
| 82  | 3.40093 | .5315981                                                   | .1045943    | .4893527      | .8115279      | 2.0811415     | 82  |
| 83  | 3.20407 | .5057020                                                   | .0615905    | .4252111      | .7281407      | 1.9821650     | 83  |
| 84  | 3.01474 | .4792493                                                   | 1.0180571   | .3604202      | .6441664      | .8787215      | 84  |
| 85  | 2.83223 | .4521285                                                   | 0.9740081   | .2951222      | .5598275      | .7770694      | 85  |
| 86  | 2.65733 | .4244461                                                   | .9298796    | .2298949      | .4757614      | .6758716      | 86  |
| 87  | 2.49170 | .3964957                                                   | .8858716    | .1649543      | .3922763      | .5754213      | 87  |
| 88  | 2.34430 | .3700132                                                   | .8435900    | .1019945      | .3111703      | .4774179      | 88  |
| 89  | 2.20064 | .3425484                                                   | .8009402    | 1.0391694     | .2306276      | .3798427      | 89  |
| 90  | 2.06847 | .3156499                                                   | .7595438    | 0.9782351     | .1523659      | .2840588      | 90  |
| 91  | 1.94648 | .2892498                                                   | .7194873    | .9194201      | .0764422      | .1895750      | 91  |
| 92  | 1.83450 | .2635179                                                   | .6811355    | .8631629      | 1.0029200     | .0956803      | 92  |
| 93  | 1.73529 | .2393728                                                   | .6454127    | .8102728      | 0.9319802     | 1.0015124     | 93  |
| 94  | 1.64659 | .2165841                                                   | .6121939    | .7603446      | .8622212      | 0.9043484     | 94  |
| 95  | 1.57001 | .1959017                                                   | .5821350    | .7133241      | .7921842      | .8011074      | 95  |
| 96  | 1.50664 | .1780081                                                   | .5554923    | .6681845      | .7190162      | .6869246      | 96  |
| 97  | 1.45710 | .1634885                                                   | .5318649    | .6225474      | .6381140      | .5544839      | 97  |
| 98  | 1.42386 | .1534665                                                   | .5101448    | .5726781      | .5430207      | .3930388      | 98  |
| 99  | 1.37606 | .1386378                                                   | .4808270    | .5068612      | .4172928      | 0.1793030     | 99  |
| 100 | 1.31178 | .1178621                                                   | .4427006    | .4192651      | .3468851      | 9.8882550     | 100 |
| 101 | 1.29562 | .1124779                                                   | .4072786    | .3098104      | 0.0207345     | 9.4829929     | 101 |
| 102 | 1.19757 | .0783014                                                   | .3293938    | 0.1227434     | 9.6556065     | 8.8013004     | 102 |
| 103 | 1.04336 | 0.0184324                                                  | 0.2039704   | 9.8222182     | 9.0333431     |               | 103 |
| 104 | .75285  | 9.8767073                                                  | 9.9704598   | 9.2586524     |               |               | 104 |
| 105 | .31746  | 9.5016904                                                  | 9.5016904   |               |               |               | 105 |
| 106 |         |                                                            |             |               |               |               | 106 |



This much being explained, the means are now given by which to test the practical merits of this mode of approximating to the values of Annuities.

For example, if it were required to find the value of an Annuity at any age  $x$ , say age 40, assuming the rate of interest Six per Cent., then the process of calculation is as follows:—

$$\lambda.A_x = 2.2010889$$

$$\lambda.k = 7.9746942$$

$$0.1757831 = - \quad 1.49894 = A_x.k$$

$$\lambda.C_x = 4.0489164$$

$$\lambda.k^3 = 3.9240826$$

$$7.9729990 = - \quad .00940 = C_x.k^3$$

$$- \quad 1.50834 = (A_x.k) + (C_x.k^3)$$

$$+ \quad .12994$$

$$- \quad 1.37840$$

$$a_{40} \text{ at 5 per cent.} = \quad 13.35638$$

$$11.97798 = a'_{40} \text{ at 6 per cent. by approximation.}$$

$$11.97794 = a_{40} \text{ at 6 per cent. by direct calculation from Table 7.}$$

$$\lambda.B_x = 3.1623743$$

$$\lambda.k^2 = 5.9493884$$

$$9.1117627 = + \quad .12935 = B_x.k^2$$

$$\lambda.D_x = 4.8687331$$

$$\lambda.k^4 = 1.8987768$$

$$6.7675099 = + \quad .00059 = D_x.k^4$$

$$+ \quad .12994 = (B_x.k^2) + (D_x.k^4)$$

In this example the logarithms of the two factors  $A_x.k$  &c. &c. are kept separate, but as already stated, this is unnecessary, as it is easy for any one accustomed to calculations of the sort to write down at once the sum of the logarithms by inspection as follows:—

$$\lambda.A_x.k = 0.1757831 = - \quad 1.49849 = A_x.k$$

$$\lambda.C_x.k^3 = 7.9729990 = - \quad .00940 = C_x.k^3$$

$$- \quad 1.50834 = (A_x.k) + (C_x.k^3)$$

$$+ \quad .12994$$

$$- \quad 1.37840$$

$$a_{40} \text{ at 5 per cent.} = \quad 13.35638$$

$$11.97798 = a'_{40} \text{ at 6 per cent. by approximation.}$$

$$11.97794 = a_{40} \text{ at 6 per cent. by direct calculation from Table 7.}$$

$$\lambda.B_x.k^2 = 9.1117627 = + \quad .12935 = B_x.k^2$$

$$\lambda.D_x.k^4 = 6.7675099 = + \quad .00059 = D_x.k^4$$

$$+ \quad .12994 = (B_x.k^2) + (D_x.k^4)$$

$$\lambda.A_x.k = 0.4727351 = - \quad 2.96985 = A_x.k$$

$$\lambda.C_x.k^3 = 8.8638550 = - \quad .07309 = C_x.k^3$$

$$- \quad 3.04294 = (A_x.k) + (C_x.k^3)$$

$$+ \quad .51679$$

$$- \quad 2.52615$$

$$a_{40} \text{ at 5 per cent.} = \quad 13.35638$$

$$10.83023 = a'_{40} \text{ at 7 per cent. by approximation.}$$

$$10.82934 = a_{40} \text{ at 7 per cent. by direct calculation from Table 8.}$$

$$\lambda.B_x.k^2 = 9.7056667 = + \quad .50777 = B_x.k^2$$

$$\lambda.D_x.k^4 = 7.9553179 = + \quad .00902 = D_x.k^4$$

$$+ \quad .51679 = (B_x.k^2) + (D_x.k^4)$$



$$\begin{aligned}
 \lambda.A_x.k &= 0.6447864 = - 4.41353 = A_x.k & \lambda.B_x.k^2 &= 0.0497693 = + 1.12142 = B_x.k^2 \\
 \lambda.C_x.k^3 &= 9.3800089 = - .23989 = C_x.k^3 & \lambda.D_x.k^4 &= 8.6435231 = + .04401 = D_x.k^4 \\
 & & & + 1.16543 = (B_x.k^2) + (D_x.k^4) \\
 & & & + 1.16543 \\
 & & & - 3.48799 \\
 a_{40} \text{ at 5 per cent.} &= 13.35638 & 9.86839 &= a'_{40} \text{ at 8 per cent. by approximation.} \\
 & & 9.86223 &= a_{40} \text{ at 8 per cent. by direct calculation from Table 9.}
 \end{aligned}$$

$$\begin{aligned}
 \lambda.A_x.k &= 0.7657224 = - 5.83072 = A_x.k & \lambda.B_x.k^2 &= 0.2916413 = + 1.95723 = B_x.k^2 \\
 \lambda.C_x.k^3 &= 9.7428169 = - .53312 = C_x.k^3 & \lambda.D_x.k^4 &= 9.1272671 = + .13405 = D_x.k^4 \\
 & & & + 2.09128 = (B_x.k^2) + (D_x.k^4) \\
 & & & + 2.09128 \\
 & & & - 4.27256 \\
 a_{40} \text{ at 5 per cent.} &= 13.35638 & 9.08382 &= a'_{40} \text{ at 9 per cent. by approximation.} \\
 & & 9.04002 &= a_{40} \text{ at 9 per cent. by direct calculation from Table 10.}
 \end{aligned}$$

$$\begin{aligned}
 \lambda.A_x.k &= 0.8586662 = - 7.22215 = A_x.k & \lambda.B_x.k^2 &= 0.4775289 = + 3.00282 = B_x.k^2 \\
 \lambda.C_x.k^3 &= 0.0216483 = - 1.05111 = C_x.k^3 & \lambda.D_x.k^4 &= 9.4990423 = + .31553 = D_x.k^4 \\
 & & & + 3.31835 = (D_x.k^2) + (D_x.k^4) \\
 & & & + 3.31835 \\
 & & & - 4.95491 \\
 a_{40} \text{ at 5 per cent.} &= 13.35638 & 8.40147 &= a'_{40} \text{ at 10 per cent. by approximation.} \\
 & & 8.33469 &= a_{40} \text{ at 10 per cent. by direct calculation from Table 11.}
 \end{aligned}$$

In the next place when it is required to find the values of annuities at a less rate of interest than that on which the Commutation Table has been constructed, it is obvious that  $k$  being in this case a negative quantity the signs of all the terms of the series in Equation (2) page 595, will be positive, thus

$$a'_x = a_x + A_x.k + B_x.k^2 + C_x.k^3 + D_x.k^4 + \&c. \&c.$$

Hence to find the value of an annuity at  $4\frac{1}{2}$  per cent.:—

$$\begin{aligned}
 \lambda.A_x.k &= 9.8809436 = .76023 = A_x.k \\
 \lambda.B_x.k^2 &= 8.5220837 = .03327 = B_x.k^2 \\
 \lambda.C_x.k^3 &= 7.0884805 = .00123 = C_x.k^3 \\
 \lambda.D_x.k^4 &= 5.5881519 = .00004 = D_x.k^4 \\
 & & & .79477 \\
 a_{40} \text{ at 5 per cent.} &= 13.35638 & 14.15115 &= a'_{40} \text{ at } 4\frac{1}{2} \text{ per cent. by approximation.} \\
 & & 14.15114 &= a_{40} \text{ at } 4\frac{1}{2} \text{ per cent. by direct calculation from Table 5.}
 \end{aligned}$$



$$\lambda.A_x.k = 0.1840563 = 1.52776 = A_x.k$$

$$\lambda.B_x.k^2 = 9.1283091 = .13437 = B_x.k^2$$

$$\lambda.C_x.k^3 = 7.9978186 = .00995 = C_x.k^3$$

$$\lambda.D_x.k^4 = 6.8006027 = .00063 = D_x.k^4$$

$$1.67271$$

$$a_{40} \text{ at 5 per cent.} = 13.35638$$

$$15.02909 = a'_{40} \text{ at 4 per cent. by approximation.}$$

$$15.02912 = a_{40} \text{ at 4 per cent. by direct calculation from Table 4.}$$

$$\lambda.A_x.k = 0.3622412 = 2.30272 = A_x.k$$

$$\lambda.B_x.k^2 = 9.4846789 = .30527 = B_x.k^2$$

$$\lambda.C_x.k^3 = 8.5323733 = .03407 = C_x.k^3$$

$$\lambda.D_x.k^4 = 7.5133423 = .00326 = D_x.k^4$$

$$2.64532$$

$$a_{40} \text{ at 5 per cent.} = 13.35638$$

$$16.00170 = a'_{40} \text{ at } 3\frac{1}{2} \text{ per cent. by approximation.}$$

$$16.00196 = a_{40} \text{ at } 3\frac{1}{2} \text{ per cent. by direct calculation from Table 3.}$$

$$\lambda.A_x.k = 0.4892822 = 3.08519 = A_x.k$$

$$\lambda.B_x.k^2 = 9.7387609 = .54798 = B_x.k^2$$

$$\lambda.C_x.k^3 = 8.9134963 = .08194 = C_x.k^3$$

$$\lambda.D_x.k^4 = 8.0215063 = .01051 = D_x.k^4$$

$$3.72562$$

$$a_{40} \text{ at 5 per cent.} = 13.35638$$

$$17.08200 = a'_{40} \text{ at 3 per cent. by approximation.}$$

$$17.08322 = a_{40} \text{ at 3 per cent. by direct calculation from Table 2.}$$

In like manner may an Auxiliary Table be formed for Joint Lives. The process is precisely similar to that employed in the construction of Table 21, and needs no further explanation more than observing that a series of difference columns will be needed for each disparity of age. The following specimen has been selected for illustration, in which the disparity of age is fifty years, and it has been deduced from the  $N_{x,y}$  column, Table 14, page 573, in exactly the same manner in which Table 21 was formed from Table 6. By means of Table 22, may Joint Annuities, for all ages in which the disparity of age is 50 years, be determined at any rate of interest. After the preceding illustrations in respect to Single Lives, the following cases for Joint Lives will be easily understood.

In the following examples, in consequence of the Commutation Table from which the calculations are made having been constructed at 7 per cent. the constants  $k, k^2, k^3, \&c. \&c.$  will have a different value from those given in page 597 *ante*, which were prepared so as to apply to a Commutation Table of 5 per cent. In approximating to the

[values of



TABLE 22.

Disparity 50 Years.

| Ages. |     | $a_{x,y}$ | TABLE 14.<br>$\lambda.N_{(x,y)+1} - \lambda.D_{x,y}$<br>$= \lambda.a_{x,y}$ | $\lambda.A_{x,y}$ | $\lambda.B_{x,y}$ | $\lambda.C_{x,y}$ | $\lambda.D_{x,y}$ |
|-------|-----|-----------|-----------------------------------------------------------------------------|-------------------|-------------------|-------------------|-------------------|
| $x$   | $y$ |           |                                                                             |                   |                   |                   |                   |
| 10    | 60  | 7.48604   | 0.8742521                                                                   | 1.7239286         | 2.4390996         | 3.0838689         | 3.6663932         |
| 11    | 61  | 7.31068   | .8639580                                                                    | .7031249          | .4059418          | 3.0382217         | .6082751          |
| 12    | 62  | 7.12466   | .8527641                                                                    | .6810288          | .3711143          | 2.9905857         | .5478831          |
| 13    | 63  | 6.92895   | .8406676                                                                    | .6576637          | .3346412          | .9409798          | .4852309          |
| 14    | 64  | 6.72638   | .8277811                                                                    | .6331595          | .2966499          | .8895255          | .4204364          |
| 15    | 65  | 6.51800   | .8141141                                                                    | .6075457          | .2571653          | .8362414          | .3535139          |
| 16    | 66  | 6.30725   | .7998399                                                                    | .5809968          | .2163533          | .7812881          | .2846210          |
| 17    | 67  | 6.09477   | .7849576                                                                    | .5535128          | .1742049          | .7246513          | .2137426          |
| 18    | 68  | 5.88221   | .7695404                                                                    | .5251569          | .1307742          | .6663829          | .1409287          |
| 19    | 69  | 5.66907   | .7535118                                                                    | .4958497          | .0859759          | .6063959          | 3.0660931         |
| 20    | 70  | 5.45552   | .7368364                                                                    | .4655582          | 2.0397733         | .5446532          | 2.9891995         |
| 21    | 71  | 5.24164   | .7194675                                                                    | .4342409          | 1.9921234         | .4811141          | .9102101          |
| 22    | 72  | 5.02817   | .7014101                                                                    | .4019115          | .9430427          | .4157978          | .8291472          |
| 23    | 73  | 4.81490   | .6825875                                                                    | .3685157          | .8924824          | .3486602          | .7459719          |
| 24    | 74  | 4.60331   | .6630702                                                                    | .3341404          | .8405366          | .2798001          | .6607904          |
| 25    | 75  | 4.39289   | .6427500                                                                    | .2987172          | .7871493          | .2091676          | .5735617          |
| 26    | 76  | 4.18569   | .6217673                                                                    | .2624133          | .7324974          | .1369459          | .4844828          |
| 27    | 77  | 3.98126   | .6000209                                                                    | .2251827          | .6765467          | 2.0631087         | .3935471          |
| 28    | 78  | 3.78229   | .5777542                                                                    | .1872939          | .6195696          | 1.9879390         | .3010647          |
| 29    | 79  | 3.58914   | .5549899                                                                    | .1487967          | .5616185          | .9115080          | .2081449          |
| 30    | 80  | 3.40359   | .5319368                                                                    | .1098882          | .5028907          | .8340441          | .1120639          |
| 31    | 81  | 3.22404   | .5084000                                                                    | .0703970          | .4432304          | .7554371          | 2.0157690         |
| 32    | 82  | 3.05180   | .4845565                                                                    | .0304867          | .3828263          | .6759392          | 1.9185774         |
| 33    | 83  | 2.88505   | .4601531                                                                    | .9899411          | .3215215          | .5954727          | .8204785          |
| 34    | 84  | 2.72352   | .4351310                                                                    | .9487681          | .2584125          | .5142232          | .7217227          |
| 35    | 85  | 2.56646   | .4093348                                                                    | .9069509          | .1966014          | .4323819          | .6225607          |
| 36    | 86  | 2.41596   | .3830896                                                                    | .8649334          | .1336463          | .3505963          | .5236873          |
| 37    | 87  | 2.27144   | .3563019                                                                    | .8228339          | .0707795          | .2691866          | .4254471          |
| 38    | 88  | 2.14236   | .3308932                                                                    | .7823024          | 1.0096756         | .1899647          | .3295988          |
| 39    | 89  | 2.01556   | .3043950                                                                    | .7412351          | 0.9485056         | .1111693          | .2342285          |
| 40    | 90  | 1.89822   | .2783463                                                                    | .7012459          | .8890343          | 1.0345795         | .1408102          |
| 41    | 91  | 1.78936   | .2526984                                                                    | .6624276          | .8315301          | 0.9603576         | 1.0489953         |
| 42    | 92  | 1.68872   | .2275564                                                                    | .6251182          | .7764699          | .8886670          | 0.9581922         |
| 43    | 93  | 1.59916   | .2038919                                                                    | .5902948          | .7247715          | .8198629          | .8677000          |
| 44    | 94  | 1.51864   | .1814545                                                                    | .5578549          | .6761460          | .7526989          | .7749054          |
| 45    | 95  | 1.44884   | .1610211                                                                    | .5285351          | .6307133          | .6858859          | .6768303          |
| 46    | 96  | 1.39089   | .1432918                                                                    | .5026876          | .5876100          | .6166909          | .5686582          |
| 47    | 97  | 1.34558   | .1289095                                                                    | .4800591          | .5446206          | .5406087          | .4431031          |
| 48    | 98  | 1.31585   | .1192046                                                                    | .4597583          | .4981736          | .4513206          | .2894239          |
| 49    | 99  | 1.27308   | .1048566                                                                    | .4323637          | .4367336          | .3324201          | 0.0841917         |
| 50    | 100 | 1.21545   | .0847368                                                                    | .3968942          | .3546989          | 0.1697476         | 9.8022618         |
| 51    | 101 | 1.20469   | .0808742                                                                    | .3653236          | .2518422          | 9.9520836         | 9.4064106         |
| 52    | 102 | 1.11976   | 0.0491261                                                                   | .2924679          | 0.0723967         | 9.5959201         | 8.7338274         |
| 53    | 103 | .98329    | 9.9926836                                                                   | 0.1731569         | 9.7800033         | 8.9820885         |                   |
| 54    | 104 | .71710    | .8555775                                                                    | 9.9467801         | 9.2241995         |                   |                   |
| 55    | 105 | .30494    | 9.4842120                                                                   | 9.4842120         |                   |                   |                   |
| 56    | 106 |           |                                                                             |                   |                   |                   |                   |



values of Annuities therefore by means of Table 22, the following will be the value of  $\lambda.k$  for different rates of interest:—

$$\frac{r' - r}{1 + r'} = \frac{.03 - .07}{1.03} = \frac{4}{103} = .0388349 \text{ and } 8.5892221 = \lambda.k \text{ at } 3 \text{ per cent.}$$

$$\frac{r' - r}{1 + r'} = \frac{.035 - .07}{1.035} = \frac{35}{1035} = .0338164 \dots 8.5291273 = \lambda.k \dots 3\frac{1}{2} \dots$$

$$\frac{r' - r}{1 + r'} = \frac{.04 - .07}{1.04} = \frac{3}{104} = .0288461 \dots 8.4600871 = \lambda.k \dots 4 \dots$$

$$\frac{r' - r}{1 + r'} = \frac{.045 - .07}{1.045} = \frac{25}{1045} = .0239234 \dots 8.3788228 = \lambda.k \dots 4\frac{1}{2} \dots$$

$$\frac{r' - r}{1 + r'} = \frac{.05 - .07}{1.05} = \frac{2}{105} = .0190476 \dots 8.2798403 = \lambda.k \dots 5 \dots$$

$$\frac{r' - r}{1 + r'} = \frac{.06 - .07}{1.06} = \frac{1}{106} = .0094340 \dots 7.9746959 = \lambda.k \dots 6 \dots$$

$$\frac{r' - r}{1 + r'} = \frac{.08 - .07}{1.08} = \frac{1}{108} = .0092593 \dots 7.9665782 = \lambda.k \dots 8 \dots$$

$$\frac{r' - r}{1 + r'} = \frac{.09 - .07}{1.09} = \frac{2}{109} = .0183486 \dots 8.2636029 = \lambda.k \dots 9 \dots$$

$$\frac{r' - r}{1 + r'} = \frac{.10 - .07}{1.10} = \frac{3}{110} = .0272727 \dots 8.4357281 = \lambda.k \dots 10 \dots$$

AGES.

$$10 - 60 \left\{ \begin{array}{ll} \lambda.A_{x,y}.k = 9.6905068 = .49035 = A_{x,y}.k & \lambda.B_{x,y}.k^2 = 8.3722560 = .02356 = B_{x,y}.k^2 \\ \lambda.C_{x,y}.k^3 = 6.9836035 = .00096 = C_{x,y}.k^3 & \lambda.D_{x,y}.k^4 = 5.5327060 = .00003 = D_{x,y}.k^4 \\ \quad .49131 = (A_{x,y}.k) + (C_{x,y}.k^3) & \quad .02359 = (B_{x,y}.k^2) + (D_{x,y}.k^4) \\ \quad .02359 & \\ \quad .46772 & \end{array} \right.$$

$$a_{10,60} \text{ at } 7 \text{ per cent.} = 7.48604 \quad 7.01832 = a'_{x,y} \text{ at } 8 \text{ per cent.}$$

$$10 - 60 \left\{ \begin{array}{ll} \lambda.A_{x,y}.k = 0.1596567 = 1.44430 = A_{x,y}.k & \lambda.B_{x,y}.k^2 = 9.3105558 = .20444 = B_{x,y}.k^2 \\ \lambda.C_{x,y}.k^3 = 8.3910532 = .02461 = C_{x,y}.k^3 & \lambda.D_{x,y}.k^4 = 7.4093056 = .00257 = D_{x,y}.k^4 \\ \quad 1.46891 & \quad .20701 \\ \quad .20701 & \\ \quad 1.26190 & \end{array} \right.$$

$$a_{10,60} \text{ at } 7 \text{ per cent.} = 7.48604 \quad 6.22414 = a'_{x,y} \text{ at } 10 \text{ per cent.}$$



AGES.

10 — 60

$$\left\{ \begin{array}{l} \lambda.A_{x,y}.k = 0.0037689 = 1.00872 = A_{x,y}.k \\ \lambda.C_{x,y}.k^3 = 7.9233898 = .00838 = C_{x,y}.k^3 \end{array} \right.$$

1.01710  
.10033  
1.11743

$a_{10,60}$  at 7 per cent. = 7.48604

$\lambda.B_{x,y}.k^2 = 8.9987802 = .09972 = B_{x,y}.k^2$   
 $\lambda.D_{x,y}.k^4 = 6.7857544 = .00061 = D_{x,y}.k^4$

.10033

$8.60347 = a'_{x,y}$  at 5 per cent.

10 — 60

$$\left\{ \begin{array}{l} \lambda.A_{x,y}.k = 0.3131507 = 2.05660 = A_{x,y}.k \\ \lambda.C_{x,y}.k^3 = 8.8515352 = .07105 = C_{x,y}.k^3 \end{array} \right.$$

2.12765  
.42507  
2.55272

$a_{10,60}$  at 7 per cent. = 7.48604

$\lambda.B_{x,y}.k^2 = 9.6175438 = .41452 = B_{x,y}.k^2$   
 $\lambda.D_{x,y}.k^4 = 8.0232816 = .01055 = D_{x,y}.k^4$

.42507

$10.03876 = a'_{x,y}$  at 3 per cent.

20 — 70

$$\left\{ \begin{array}{l} \lambda.A_{x,y}.k = 9.7291611 = .53600 = A_{x,y}.k \\ \lambda.C_{x,y}.k^3 = 7.3354619 = .00217 = C_{x,y}.k^3 \end{array} \right.$$

.53817 = (A\_{x,y}.k) + (C\_{x,y}.k^3)  
.03701  
.50116

$a_{20,70}$  at 7 per cent. = 5.45552

$\lambda.B_{x,y}.k^2 = 8.5669791 = .03690 = B_{x,y}.k^2$   
 $\lambda.D_{x,y}.k^4 = 6.0436111 = .00011 = D_{x,y}.k^4$

.03701 = (B\_{x,y}.k^2) + (D\_{x,y}.k^4)

$4.95436 = a'_{x,y}$  at 9 per cent.

20 — 70

$$\left\{ \begin{array}{l} \lambda.A_{x,y}.k = 9.4402541 = .27558 = A_{x,y}.k \\ \lambda.C_{x,y}.k^3 = 6.4687409 = .00029 = C_{x,y}.k^3 \end{array} \right.$$

.27587  
.00976  
.28563

$a_{20,70}$  at 7 per cent. = 5.45552

$\lambda.B_{x,y}.k^2 = 7.9891651 = .00975 = B_{x,y}.k^2$   
 $\lambda.D_{x,y}.k^4 = 4.8879831 = .00001 = D_{x,y}.k^4$

.00976

$5.74115 = a'_{x,y}$  at 6 per cent.

20 — 70

$$\left\{ \begin{array}{l} \lambda.A_{x,y}.k = 9.8443810 = .69885 = A_{x,y}.k \\ \lambda.C_{x,y}.k^3 = 7.6811216 = .00480 = C_{x,y}.k^3 \end{array} \right.$$

.70365  
.06304  
.76669

$a_{20,70}$  at 7 per cent. = 5.45552

$\lambda.B_{x,y}.k^2 = 8.7974189 = .06272 = B_{x,y}.k^2$   
 $\lambda.D_{x,y}.k^4 = 6.5044907 = .00032 = D_{x,y}.k^4$

.06304

$6.22221 = a'_{x,y}$  at  $4\frac{1}{2}$  per cent.



| AGES.   |   |                                                          |  |                                                          |  |
|---------|---|----------------------------------------------------------|--|----------------------------------------------------------|--|
| 20 — 70 | { | $\lambda.A_{x,y}.k = 9.9256453 = .84265 = A_{x,y}.k$     |  | $\lambda.B_{x,y}.k^2 = 8.9599475 = .09119 = B_{x,y}.k^2$ |  |
|         |   | $\lambda.C_{x,y}.k^3 = 7.9249145 = .00841 = C_{x,y}.k^3$ |  | $\lambda.D_{x,y}.k^4 = 6.8295479 = .00068 = D_{x,y}.k^4$ |  |
|         |   | <u>.85106</u>                                            |  | <u>.09187</u>                                            |  |
|         |   | <u>.09187</u>                                            |  |                                                          |  |
|         |   | <u>.94293</u>                                            |  |                                                          |  |
|         |   | $a_{20,70}$ at 7 per cent. = <u>5.45552</u>              |  | $6.39845 = a'_{x,y}$ at 4 per cent.                      |  |
| 20 — 70 | { | $\lambda.A_{x,y}.k = 9.9946855 = .98784 = A_{x,y}.k$     |  | $\lambda.B_{x,y}.k^2 = 9.0980279 = .12532 = B_{x,y}.k^2$ |  |
|         |   | $\lambda.C_{x,y}.k^3 = 8.1320351 = .01355 = C_{x,y}.k^3$ |  | $\lambda.D_{x,y}.k^4 = 7.1057087 = .00128 = D_{x,y}.k^4$ |  |
|         |   | <u>1.00139 = (A_{x,y}.k) + (C_{x,y}.k^3)</u>             |  | <u>.12660 = (B_{x,y}.k^2) + (D_{x,y}.k^4)</u>            |  |
|         |   | <u>.12660</u>                                            |  |                                                          |  |
|         |   | <u>1.12799</u>                                           |  |                                                          |  |
|         |   | $a_{20,70}$ at 7 per cent. = <u>5.45552</u>              |  | $6.58351 = a'_{x,y}$ at $3\frac{1}{2}$ per cent.         |  |

Bayerische  
Staatsbibliothek  
München



# APPENDIX.

## NOTE I.—(page 10.)

### *Expectation of Life.*

| Ages. | Milne.<br>Carlisle,<br>A.D. 1779—1787.<br>Both Sexes. | Deparcieux.<br>Tontine<br>Nominees.<br>Both Sexes. | Demonferrand.<br>France,<br>A.D. 1817—1832. |          | Assured Lives.        |                        | Ages. |
|-------|-------------------------------------------------------|----------------------------------------------------|---------------------------------------------|----------|-----------------------|------------------------|-------|
|       |                                                       |                                                    | Males.                                      | Females. | Equitable,<br>Davies. | Amicable.<br>Galloway. |       |
| 10    | 48.82                                                 | 46.83                                              | 47.00                                       | 47.42    | 48.83                 | ...                    | 10    |
| 15    | 45.00                                                 | 43.50                                              | 43.58                                       | 43.66    | 44.81                 | ...                    | 15    |
| 20    | 41.46                                                 | 40.25                                              | 40.00                                       | 40.08    | 41.06                 | ...                    | 20    |
| 25    | 37.86                                                 | 37.17                                              | 37.25                                       | 36.83    | 37.44                 | 37.805                 | 25    |
| 30    | 34.34                                                 | 34.08                                              | 34.00                                       | 33.41    | 33.98                 | 33.681                 | 30    |
| 35    | 31.00                                                 | 30.92                                              | 30.50                                       | 30.00    | 30.66                 | 29.721                 | 35    |
| 40    | 27.61                                                 | 27.50                                              | 27.00                                       | 26.58    | 27.40                 | 25.944                 | 40    |
| 45    | 24.46                                                 | 23.92                                              | 23.41                                       | 23.16    | 24.10                 | 22.365                 | 45    |
| 50    | 21.11                                                 | 20.42                                              | 19.91                                       | 19.58    | 20.83                 | 18.994                 | 50    |
| 55    | 17.58                                                 | 17.25                                              | 16.50                                       | 16.25    | 17.85                 | 15.832                 | 55    |
| 60    | 14.34                                                 | 14.25                                              | 13.25                                       | 13.16    | 15.06                 | 12.878                 | 60    |
| 65    | 11.79                                                 | 11.25                                              | 10.58                                       | 10.50    | 12.35                 | 10.264                 | 65    |
| 70    | 9.18                                                  | 8.67                                               | 8.08                                        | 8.08     | 9.84                  | 8.113                  | 70    |
| 75    | 7.01                                                  | 6.50                                               | 6.16                                        | 6.16     | 7.52                  | 6.345                  | 75    |
| 80    | 5.51                                                  | 4.67                                               | 4.75                                        | 4.75     | 5.38                  | 4.884                  | 80    |

| Ages. | Milne.                                 |          |             |                                 |          | Duvillard.<br>France.<br>Both Sexes. | Price.<br>Northampton.<br>A.D.1735-1780.<br>Both Sexes. | Ages. |
|-------|----------------------------------------|----------|-------------|---------------------------------|----------|--------------------------------------|---------------------------------------------------------|-------|
|       | Sweden and Finland.<br>A.D. 1776—1795. |          |             | Montpellier.<br>A.D. 1772—1792. |          |                                      |                                                         |       |
|       | Males.                                 | Females. | Both Sexes. | Males.                          | Females. |                                      |                                                         |       |
| 10    | 45.03                                  | 47.28    | 46.16       | 44.12                           | 46.77    | 40.80                                | 39.78                                                   | 10    |
| 15    | 41.51                                  | 43.74    | 42.63       | 40.06                           | 43.02    | 37.40                                | 36.51                                                   | 15    |
| 20    | 37.86                                  | 40.04    | 38.96       | 36.52                           | 39.45    | 34.26                                | 33.43                                                   | 20    |
| 25    | 34.48                                  | 36.44    | 35.47       | 33.49                           | 36.32    | 31.34                                | 30.85                                                   | 25    |
| 30    | 31.22                                  | 33.00    | 32.12       | 30.43                           | 33.34    | 28.52                                | 28.27                                                   | 30    |
| 35    | 27.95                                  | 29.68    | 28.82       | 27.30                           | 30.41    | 25.72                                | 25.68                                                   | 35    |
| 40    | 24.61                                  | 26.27    | 25.45       | 24.06                           | 27.45    | 22.89                                | 23.08                                                   | 40    |
| 45    | 21.45                                  | 23.03    | 22.26       | 21.00                           | 24.44    | 20.05                                | 20.52                                                   | 45    |
| 50    | 18.36                                  | 19.66    | 19.03       | 18.23                           | 21.35    | 17.23                                | 17.99                                                   | 50    |
| 55    | 15.39                                  | 16.37    | 15.90       | 15.53                           | 18.42    | 14.51                                | 15.58                                                   | 55    |
| 60    | 12.47                                  | 13.18    | 12.85       | 13.14                           | 15.73    | 11.95                                | 13.21                                                   | 60    |
| 65    | 9.92                                   | 10.41    | 10.19       | 11.01                           | 13.22    | 9.63                                 | 10.88                                                   | 65    |
| 70    | 7.87                                   | 8.12     | 8.01        | 9.02                            | 10.79    | 7.58                                 | 8.60                                                    | 70    |
| 75    | 6.13                                   | 6.38     | 6.27        | 7.07                            | 8.44     | 5.87                                 | 6.54                                                    | 75    |
| 80    | 4.75                                   | 4.94     | 4.85        | 5.17                            | 6.17     | 4.60                                 | 4.75                                                    | 80    |



## NOTE II.—(page 19.)

## RURAL DISTRICTS.

- Anglesea*—Beaumaris, Llanerchymedd, Llansadwrn.
- Bedfordshire*—Ampthill, Dunstable, Eaton Socon, Henlow, Harrold, Maulden, Oakely, St. Loyds, Renhold, Silsoe, Woburn.
- Berkshire*—Sunning Hill, Maidenhead, Winkfield.
- Buckinghamshire*—Aylesbury, Dagnall, Eton, Great Marlow, Great Misenden, Lower Winchendon, Newport Pagnell, Stoke Poges, Weston Turville, Wooburn.
- Breconshire*—Brecknock, Hay, Llomelly, Tassiny, Pridd.
- Cambridgeshire*—Ickleton, Melbourn, Whittlesford.
- Cardiganshire*—Yspytty Confin.
- Carmarthenshire*—Langodock, Pembrey.
- Carnarvonshire*—Bangor, Carmel, Llandwrog.
- Cheshire*—Ashton-upon-Mersey, Buglawton, Congleton, Horridge End, Middlewich, Sandbach, Weaverham.
- Cornwall*—Bodmin, Breaze, Helstone, Kilkhampton, Marazion, Millbrook, North Hill, Church Town, Quethiock, St. Kenerne, C. T., St. Ive, St. Germans, St. Ewe, St. Agnes, Torpoint, Tuckingmill.
- Cumberland*—Cockermouth.
- Derbyshire*—Clonn, Cubley, Dronfield, Dale Abbey, Glossip, Middleton, Miller Moor End, Pentrich, Peakforest, Sanley, Thorpe, Walton.
- Denbighshire*—Llanfair Talhaïam, Llandogla.
- Devonshire*—Ashford, Bovey Tracy, Broadclist, Bishops Nympton, Chudleigh, Churston Ferrers, Cornworthy, Dodbrook, Great Torrington, Hartland, Holsworthy, Hatherleigh, Hennock, Kingskernell, Kingsbridge, Modbury, Moretonhampstead, Merton, Newton Abbott, Newton Bushel, Northlen, Plymstock, Stokefleming, Totnes, Whitchurch.
- Dorsetshire*—Hilton, Lyme Regis, Sherborne, Tarrant Munckton, Wyke Regis.
- Durham*—Burnopfield, Bishop Huckland, Houghton le Spring, Longridge, Monkwearmouth, Sedgfield, Winlaton.
- Essex*—Arkesden, Chigwell, Castle Hedingham, Dedham, Fordham, Great Baddow, Great Chesterfield, Gestingthorpe, Goldhanger, Hatfield Heath, Leigh, Loughton, Stebbing, St. Osyth, Witham, White Northley, Walthamstow.
- Flintshire*—Llanhasa, Mold, St. Asaph.
- Glamorganshire*—Aberayron, Canphilly, Eglurysilan, Gellygear, Llangonoyd, Llanfabon, Pontardylas near Swansea, Lantwit-juxta-Neath.
- Gloucestershire*—Arlingham, Frampton-on-Severne, John St. Spt. Nily, Lechlade, Newnham, North Verney, Prestbury, Paintneck, Sherborne, Stow-in-the-Wold, Stapeton, Tewkesbury, Tidenham, Winchcomb, Woolaston, Yate, Yatton.
- Hampshire*—Bitterne, Breamore, Buriton, Burley, Christchurch, Eling, Fordingbridge, Millbrook, Swarthling, Westend, Winchester, Wootton, (Isle of Wight,) West Cowes, I. W.



- Hertfordshire*—Lemsford Mills, North Mimms, Stevenage.  
*Huntingdonshire*—Deddington, Huntingdon.  
*Isle of Jersey*—St. Heliers.  
*Kent*—Chislehurst, Cranbrook, Queenborough, Seven Oaks, St. Peters, Margate, Wrotham, Woolwich.  
*Lancashire*—Caton, Church Town, Chipping, Dalton, Everton, Hunts Bank, Manchester, Kirkham, Long Ashton, Lathorn, Ribchester, Skelmorsdale.  
*Leicestershire*—Barwell, Markfield, Misterton, Quorndon, Sileby, Whitwitch.  
*Lincoln*—Barrowby, Crowland, Deeping, Dorrington, Horncastle, Sleaford, Sutton Wash, South Witham.  
*Merionethshire*—Blamare, Bala, Llwyngwrl, Llanfachreth, Llanderfel, Penlyn, Trawsfynydd.  
*Monmouthshire*—Chepstow, Llanfeangel, Pantengue, Ragland.  
*Montgomeryshire*—Llanidloes, Welsh Pool.  
*Northamptonshire*—Kingsthorpe, Kettering, Little Houghton, Peakirk, Peterborough, Wellingborough.  
*Norfolk*—Aylesham, Hainford, Kirkling, Ludham, Melton Parva, Snettisham, Shipsham, Strumpshaw.  
*Northumberland*—(Not stated.)  
*Nottinghamshire*—Carlton, Stapleford.  
*Oxfordshire*—Banbury, Fritwell, Oxford, Steeple Ashton.  
*Pembrokeshire*—Begelly, St. Florence.  
*Radnorshire*—Presteign.  
*Shropshire*—Ellesmere, Hodnet, Mensterley, Norton, Rayton, Seluttyn, Whitechurch.  
*Somersetshire*—Bath-Easton, Rutleigh Chew Stoke, Marsbury, Badstock, Stogumber, Wellington, Wincanton, Washford.  
*Staffordshire*—Ashley, Biddulph, Bursben, Bloxwich, Cobridge, Endon, Hanley, Lone End, Pelsall, Trentham, Wolstanton, Yovall.  
*Suffolk*—Bungay, Bury St. Edmunds, Haverhill, Lanshall, Sudbury, Withersfield.  
*Surrey*—Dorking, Godalming, Horsley, Kingston, Richmond, Sandon, Tatesfield.  
*Sussex*—Billinghurst, Compton, Loxwood, Rothersfield, Wilmington.  
*Warwickshire*—Alcester, Berkswell, Halford, Knowle, Polesworth.  
*Wiltshire*—Aldbourn, Chisledon, Corsham, Donhead, East Knoyle, Highworth, Malmesbury, Wootten Bassett.  
*Worcestershire*—Longdon, Pershore.  
*Yorkshire*—Bentham, Boonsley, Briggatt, Dunkensfield, Driffild, Gildersome, Grassington, Harewood, Hawden, Holmpitch, Headingley, Overblow, Queenshead, Rastrick, Scholes, Stanningly, Steeton, Thorne, Thurstonland.



## TOWN DISTRICTS.—(page 19.)

*Bedfordshire*—Bedford.  
*Breconshire*—Crickhowell.  
*Cambridgeshire*—Cambridge.  
*Cheshire*—Astbury and Lanton, Chester.  
*Cornwall*—Camborne, Penzance, Redruth, St. Austell.  
*Derbyshire*—Alfreton, Chesterfield.  
*Denbighshire*—Wrexham.  
*Dorsetshire*—Blandford.  
*Durham*—Stockton, Stockton-on-Tees, Sunderland, South Shields.  
*Essex*—Barking, Chelmsford.  
*Flintshire*—Holywell.  
*Glamorganshire*—Swansea.  
*Gloucestershire*—Cheltenham, Stroud.  
*Hampshire*—Portsea, Southampton, Winchester.  
*Kent*—Deptford, Maidstone.  
*Lancashire*—Ashton, Ashton-under-Lyne, Blackburn, Friargate Preston, (and Town near Manchester.)  
*Lincoln*—Lincoln, Stamford.  
*Middlesex*—Fulham.  
*Monmouthshire*—Bedwelty, Pontypool.  
*Northamptonshire*—Northampton.  
*Norfolk*—Norwich, Great Yarmouth, Yarmouth.  
*Northumberland*—Newcastle, Tynemouth.  
*Pembrokeshire*—Pembroke.  
*Shropshire*—Shrewsbury, Wellington.  
*Somersetshire*—Bath.  
*Staffordshire*—Stafford, Stone, Stoke-upon-Trent, Sedgeley, Tamworth, Walsall, West Bromwich.  
*Surrey*—Beaubridge, Dulwich.  
*Sussex*—Brighton.  
*Warwickshire*—Coventry, Nuneaton.  
*Wiltshire*—Trowbridge.  
*Worcestershire*—Bromsgrove, Dudley.  
*Yorkshire*—Bradford, Halifax, Huddersfield, Whitby.

## CITY DISTRICTS.—(page 19.)

*Devonshire*—Devonport.  
*Gloucestershire*—Bristol.  
*Lancashire*—Liverpool and Suburbs.

*Middlesex*—London and Suburbs.  
*Warwickshire*—Birmingham.  
*Yorkshire*—Leeds, Sheffield, York.



## NOTE III.—(page 67.)

## LIST OF DISTRICTS IN SCOTLAND.

## RURAL DISTRICTS.

Aberdour.  
 Borrowstounness.  
 Catrine.  
 Ceres.  
 Coldingham.  
 Currie.  
 Dalry.  
 Dunbar.  
 Dunse.  
 Rosehearty.  
 Saltcoats.  
 Greenlaw.  
 Turriff.  
 Kirkmichael.  
 Alexandria.  
 Anstruther.  
 Mauchline.  
 Musselburgh.  
 Newburgh.  
 Stranraer.

Douglas.  
 Stornoway.  
 Strichen.  
 Strathaven.  
 Thornliebank.  
 Westquarter.  
 Preston Pans.  
 Kilwinning.  
 Stevenston.

## TOWNS.

Arbroath.  
 Kilmarnock.  
 Dalkeith.  
 Campbelltown.

## CITIES.

Edinburgh.  
 Glasgow.  
 Paisley.  
 Aberdeen.

## NOTE IV.

*Factory Trades, forming Table S. S., page 454.*

Blanket Weavers.  
 Cloth Workers.  
 Cloth Dressers.  
 Cotton Spinners.  
 Factorymen.  
 Flax Dressers.  
 Flax Weavers.  
 Frame Work Knitters.  
 Hemp Dressers.  
 Lace Manufacturers.  
 Lace Workers.  
 Manufacturers.  
 Needle Makers.

Pin Makers.  
 Sack Weavers.  
 Silkmen.  
 Silk Combers.  
 Silk Millmen.  
 Silk Spinners.  
 Silk Throwsters.  
 Silk Weavers.  
 Thread Twisters.  
 Weavers.  
 Warpers.  
 Winders.  
 Wool Combers.



## NOTE V.

*In-door Trades requiring Little Exercise, forming Table T. T., page 455.*

Accountants.  
 Awl Bladers.  
 Booksellers.  
 Boot Blockers.  
 Brass Founders.  
 Brokers.  
 Brush and Broom Makers.  
 Butlers.  
 Barbers and Hair Dressers.  
 Basket and Sieve Makers.  
 Bookbinders.  
 Braziers.  
 Clerks.  
 Cordwainers.  
 Carders.  
 Carvers and Gilders.  
 Chair Bottomers and Cane Workers.  
 Chandlers.  
 Chemists and Druggists.  
 Clickers.  
 Clothiers.  
 Confectioners.  
 Corkcutters.  
 Cutlers.  
 Drapers.  
 Eating-House Keepers.  
 Edge Tool Makers.  
 Embroiderers.  
 Engravers.  
 File Smiths.  
 Glovers and Hosiers.  
 Green Grocers.  
 Grocers.  
 Gaffers.  
 Glass Makers.  
 Glass Cutters.  
 Grinders.  
 Gunsmiths.  
 Haft Turners.

Ironmongers.  
 Jewellers.  
 Lace Manufacturers.  
 Lace Workmen.  
 Lawyers.  
 Meal Men and Flour Dealers.  
 Music Teachers.  
 Mat Makers.  
 Needle Makers.  
 Poulterers.  
 Printers.  
 Pattern Model Makers.  
 Pin Makers.  
 Pipe Makers.  
 Saddlers.  
 Schoolmasters.  
 Shopkeepers.  
 Salemen.  
 Saw Handle Makers.  
 Shoemakers.  
 Shuttle Makers.  
 Silkmen.  
 Silk Combers.  
 Silk Mill Men.  
 Silk Spinners.  
 Silk Factors.  
 Silk Throwsters.  
 Silversmiths.  
 Slate Framers.  
 Spindle Makers.  
 Spirit Merchants.  
 Stationers.  
 Stamp Distributors.  
 Stirrup and Bit Makers.  
 Straw Plaiters.  
 Tobacconists.  
 Tailors.  
 Upholsterers.  
 Victuallers.



Watchmakers.  
Weavers.  
Whitesmiths.  
Warehousemen.  
Warpers.

Wine Merchants.  
Winders.  
Woolmen.  
Wool Staplers.

## NOTE VI.

*In-door Trades requiring Great Exercise, forming Table V. V., page 456.*

Blanket Weavers.  
Bakers.  
Blacksmiths.  
Cabinetmakers.  
Coopers.  
Curriers.  
Cartwrights.  
Chairmakers.  
Coach Builders.  
Coach Smiths.  
Copper Smiths.  
Engineers.

Forgemen.  
Joiners.  
Machinemen.  
Moulder and Iron Founders.  
Millers.  
Millwrights.  
Nailers.  
Sack Weavers.  
Turners.  
Wheelwrights.  
Wool Combers.  
Wool Sorters.

## NOTE VII.

*Out-door Trades requiring Little Exercise, forming Table W. W., page 457.*

Auctioneers.  
Botanists.  
Butchers.  
Coachmen.  
Cattle Dealers.  
Colliery Agents.  
College Porters.  
Constables.  
Corn Dealers.  
Costermongers.  
Cowkeepers.  
Drivers.  
Excise Officers.  
Engine Drivers.  
Hay Binders.  
Horse Keepers.  
In Her Majesty's Customs.  
Jobbers.

Knackers.  
Land Stewards.  
Lime Merchants.  
Mail Drivers.  
Mine Agents.  
Ostlers.  
Post Boys.  
Packmen.  
Pig Dealers.  
Policemen.  
Porters.  
Quarry Agents.  
Sextons.  
Sheriffs' Officers.  
Slate Workers.  
Turnpike Keepers.  
Watchmen.



## NOTE VIII.

*Out-door Trades requiring Great Exercise, forming Table Y. Y., page 458.*

Bleachers.  
 Boat Builders.  
 Boatmen.  
 Brookers.  
 Builders.  
 Bargemen.  
 Brickmakers.  
 Bricklayers.  
 Carriers.  
 Carters.  
 Clay Cutters.  
 Drainers.  
 Draymen.  
 Drovers.  
 Excavators.  
 Firebrick Manufacturers.  
 Fishermen.  
 Farmers.  
 Gamekeepers.  
 Gardeners.  
 Graziers.  
 Hedgers.  
 Huntsmen.  
 Husbandmen.  
 Hawkers.

In Preventive Service.  
 Letter Carriers.  
 Mole Catchers.  
 Paviers.  
 Pedlers.  
 Quarrymen.  
 Rope Makers.  
 Sawyers.  
 Slaters.  
 Stonemasons.  
 Shepherds.  
 Stonecutters.  
 Surveyors.  
 Thatchers.  
 Tile Makers.  
 Tilers.  
 Timber Stowers.  
 Timber Hewers.  
 Tanners.  
 Waggoners.  
 Watermen.  
 Well Diggers.  
 Wharfingers.  
 Yeomen.



## NOTE IX.

*Expectation of Life in Ireland.*

| Age. | Males.  | Females. | Age. | Males.  | Females. |
|------|---------|----------|------|---------|----------|
| 10   | 46.6223 | 48.7375  | 56   | 15.0512 | 16.4081  |
| 11   | 45.7987 | 47.9506  | 57   | 14.5054 | 15.8327  |
| 12   | 44.9717 | 47.1564  | 58   | 13.9713 | 15.2707  |
| 13   | 44.1463 | 46.3635  | 59   | 13.4504 | 14.7240  |
| 14   | 43.3262 | 45.5727  | 60   | 12.9433 | 14.1938  |
| 15   | 42.5154 | 44.7866  | 61   | 12.4486 | 13.6784  |
| 16   | 41.7179 | 44.0077  | 62   | 11.9641 | 13.1760  |
| 17   | 40.9371 | 43.2383  | 63   | 11.4881 | 12.6848  |
| 18   | 40.1714 | 42.4773  | 64   | 11.0183 | 12.2030  |
| 19   | 39.4192 | 41.7239  | 65   | 10.5530 | 11.7287  |
| 20   | 38.6796 | 40.9770  | 66   | 10.0965 | 11.2651  |
| 21   | 37.9509 | 40.2358  | 67   | 9.6521  | 10.8149  |
| 22   | 37.2318 | 39.4991  | 68   | 9.2230  | 10.3806  |
| 23   | 36.5217 | 38.7667  | 69   | 8.8122  | 9.9643   |
| 24   | 35.8206 | 38.0387  | 70   | 8.4221  | 9.5683   |
| 25   | 35.1272 | 37.3144  | 71   | 8.0502  | 9.1902   |
| 26   | 34.4405 | 36.5942  | 72   | 7.6938  | 8.8277   |
| 27   | 33.7587 | 35.8777  | 73   | 7.3521  | 8.4792   |
| 28   | 33.0808 | 35.1651  | 74   | 7.0195  | 8.1425   |
| 29   | 32.4049 | 34.4563  | 75   | 6.6945  | 7.8156   |
| 30   | 31.7295 | 33.7515  | 76   | 6.3794  | 7.4989   |
| 31   | 31.0546 | 33.0499  | 77   | 6.0758  | 7.1929   |
| 32   | 30.3796 | 32.3516  | 78   | 5.7858  | 6.8979   |
| 33   | 29.7044 | 31.6557  | 79   | 5.5091  | 6.6145   |
| 34   | 29.0286 | 30.9626  | 80   | 5.2509  | 6.3422   |
| 35   | 28.3519 | 30.2714  | 81   | 5.0045  | 6.0796   |
| 36   | 27.6756 | 29.5816  | 82   | 4.7691  | 5.8243   |
| 37   | 27.0003 | 28.8936  | 83   | 4.5328  | 5.5741   |
| 38   | 26.3272 | 28.2068  | 84   | 4.3206  | 5.3265   |
| 39   | 25.6570 | 27.5210  | 85   | 4.1019  | 5.0783   |
| 40   | 24.9904 | 26.8362  | 86   | 3.8875  | 4.8314   |
| 41   | 24.3269 | 26.1517  | 87   | 3.6799  | 4.5860   |
| 42   | 23.6660 | 25.4670  | 88   | 3.4798  | 4.3426   |
| 43   | 23.0067 | 24.7817  | 89   | 3.2881  | 4.1005   |
| 44   | 22.3489 | 24.0956  | 90   | 3.1064  | 3.8595   |
| 45   | 21.6918 | 23.4599  | 91   | 2.9309  | 3.6143   |
| 46   | 21.0384 | 22.7229  | 92   | 2.7570  | 3.3579   |
| 47   | 20.3916 | 22.0433  | 93   | 2.5781  | 3.0798   |
| 48   | 19.7538 | 21.3722  | 94   | 2.3891  | 2.7698   |
| 49   | 19.1275 | 20.7123  | 95   | 2.1732  | 2.4398   |
| 50   | 18.5149 | 20.0658  | 96   | 1.9265  | 2.0898   |
| 51   | 17.9144 | 19.4319  | 97   | 1.6197  | 1.7251   |
| 52   | 17.3247 | 18.8091  | 98   | 1.3068  | 1.3446   |
| 53   | 16.7445 | 18.1959  | 99   | .9489   | .9375    |
| 54   | 16.1727 | 17.5915  | 100  | .5000   | .5000    |
| 55   | 15.6075 | 16.9946  |      |         |          |

The above results are deduced from the Report of the Census Commissioners for Ireland, and calculated in the same manner as that described for Tables D and R. The Mortality for the years 1839, 1840 only was taken, in order to avoid the chances of error, connected with the more remote years; as in Ireland, no actual registration of the deaths took place but only were stated from memory at the period of the Census.







# INDEX.

## ABERDEEN.

|                                                                         | <i>Page</i>   |
|-------------------------------------------------------------------------|---------------|
| Aberdeen Friendly Society, Sickness Statistics of the, 429, 430         |               |
| —— Sickness experience of, compared with                                |               |
| other Returns, . . . . .                                                | 431           |
| Accidents on Railways,— <i>See</i> Railways.                            |               |
| Actuaries' Committee, References to Reports and                         |               |
| Tables of, . . . . .                                                    | 151, 194, 196 |
| Advanced Life, in reference to its liability to, and                    |               |
| capability of enduring Sickness, . . . . .                              | 452           |
| Age, duration of Sickness as affected by,                               |               |
| 450, 451, 487, 508, 522                                                 |               |
| —— an essential item in Criminal Inquiry,                               |               |
| 302, 325, 395, 396                                                      |               |
| —— and Sex of persons Committed or Bailed                               |               |
| annually, from 1834 to 1839, . . . . .                                  | 392, 393      |
| Agricultural Counties, calculated and actual pro-                       |               |
| portion of Crime in the, . . . . .                                      | 334           |
| —— greatest and least; Signers                                          |               |
| by Mark, and amount of Crime in the, . . . . .                          | 357-362       |
| —— uniformity in the tendency                                           |               |
| to Crime in, . . . . .                                                  | 404           |
| Agricultural Districts, Criminal Phenomena as con-                      |               |
| nected with the, . . . . .                                              | 342-343       |
| Agriculturists, average ratio of, to the whole population, <i>ibid.</i> |               |
| —— and Manufacturers, relative degrees                                  |               |
| of Crime among, . . . . .                                               | 346-352       |
| Air and Exercise in connection with various                             |               |
| Occupations, . . . . .                                                  | 454, 467      |
| Allowance in Sickness,— <i>See</i> Sickness.                            |               |
| Annuities, value of, according to rate of Mortality in Friendly         |               |
| Societies, and for Rural, Town, and City Districts:—                    |               |
| Immediate, 470; Deferred, 471; Temporary, 472.                          |               |
| —— value of, calculated on the whole Population, 481                    |               |
| —— relative value of, in Rural and City Districts, 482                  |               |
| —— comparative value of, according to various                           |               |
| Tables, . . . . .                                                       | 483           |

## ARMY.

|                                                          | <i>Page</i>  |
|----------------------------------------------------------|--------------|
| Annuities, importance of careful consideration of        |              |
| Tables of, . . . . .                                     | 483          |
| —— ruinous results of Valuations based on                |              |
| erroneous Mortality Tables, . . . . .                    | 484          |
| —— value of, calculated from experience of               |              |
| Manchester Unity, . . . . .                              | 495          |
| —— deferred, as Substitutes for Sick Allow-              |              |
| ances after age of Seventy, . . . . .                    | 524          |
| Ansell, Mr., Work on Friendly Societies by, 17, 412. His |              |
| Sickness Calculations, 413. Untoward consequences of     |              |
| a reliance on his Tables, 414, 420. Comparative          |              |
| amount of Sickness according thereto, and to other       |              |
| Tables and Inquiries, 415, 417, 433. Reference to        |              |
| his Report on the Essex Provident Society, 434.          |              |
| Mr. Bassingwhite's remarks on his Calculations, 435.     |              |
| Result of his Valuation for the Society, 438. Value      |              |
| of Annuities, as given by his Tables, and by other       |              |
| authorities, 483. Discrepancies exhibited by the         |              |
| comparison, 484.— <i>See also</i> pp. 423, 425, 486.     |              |
| Army Medical Officers, Widows' Fund Society              |              |
| founded by the, . . . . .                                | 102          |
| —— Table of Mortality among Members who                  |              |
| joined the Society while Single, . . . . .               | 103          |
| —— Explanation of the Table, . . . . .                   | 104          |
| —— Abstract of same, . . . . .                           | 105          |
| —— Mortality of such Members compared with               |              |
| other Classes, . . . . .                                 | <i>ibid.</i> |
| —— High Rate of Mortality among the younger              |              |
| Ages, . . . . .                                          | 106          |
| —— Table of Mortality of Members who entered             |              |
| Married, . . . . .                                       | 107          |
| —— Abstract of, and comparison deduced from              |              |
| such Table, . . . . .                                    | 108          |
| —— Table of Mortality among Members remain-              |              |
| ing under observation while Single, . . . . .            | 109          |



| ARMY.                                                                                                                                                                            | Page          | COLLIERS.                                                                                                                                                                                        | Page     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| Army Medical Officers, Widows' Fund Society, Abstract of, and Deductions from last-mentioned Table, . . . . .                                                                    | 110, 111      | Beaumont, Lord, Committee on Provident Associations obtained in House of Lords by, 423. Object and Results of the Committee, 423, 429, 436.                                                      |          |
| —— Mortality of Members entering Single, but afterwards Married, . . . . .                                                                                                       | <i>ibid.</i>  | Beaumont, Mr., Prosperous State of Society in connection with the Lead Mines of, . . . . .                                                                                                       | 594      |
| —— Mortality among Members of both Classes under Conditions stated, . . . . .                                                                                                    | 112           | Begbie, Dr. James, on the Mortality in the Scottish Widows' Fund, &c. Society, 189. Elements omitted by him, 189, 190. Further Paper published by him, 198. Value of his Contribution, 190, 199. |          |
| —— Mortality among all the Members, . . . . .                                                                                                                                    | 113           | Bengal Military Officers, per centage of Mortality among the, . . . . .                                                                                                                          | 105      |
| —— Abstract of foregoing Tables as compared with general Mortality of England and Wales, . . . . .                                                                               | 114           | Blackburn Districts of the Manchester Unity of Odd Fellows, Results of Data furnished by, . . . . .                                                                                              | 514, 515 |
| —— Further deductions therefrom, and Tables explanatory thereof, . . . . .                                                                                                       | 115-121       | Bullen, Mr., Elegant Formula introduced by, . . . . .                                                                                                                                            | 594      |
| —— Insufficiency of Data for explaining high Rate of Mortality among the Members, . . . . .                                                                                      | 131-133       | Butchers, inverse proportion of Mortality and                                                                                                                                                    |          |
| —— Age, Date, place of Death of 308 Members, . . . . .                                                                                                                           | 132           | Sickness among, . . . . .                                                                                                                                                                        | 411      |
| Asiatic Cholera,— <i>See</i> Cholera.                                                                                                                                            |               | Cabinet and Chairmakers' Society, increase of Sickness in, over Highland Society's calculations, . . . . .                                                                                       | 419      |
| Assurance of aged Lives, fallacious opinion respecting ——— of Lives for temporary Purposes, great Increase of, . . . . .                                                         | 179           | Carlisle Tables, expected Mortality according to the, . . . . .                                                                                                                                  | 433      |
| —— of Sick Lives, Observations and Data relative to, . . . . .                                                                                                                   | 196           | Casper, Professor, of Berlin: Reference to the Statistical Labours of, . . . . .                                                                                                                 | 131      |
| Assurance Companies, Neglect of the Science of Vital Statistics by, . . . . .                                                                                                    | 144, 145, 163 | Census of 1851 the most valuable yet taken, . . . . .                                                                                                                                            | 15       |
| —— Dangers inherent in the present System, . . . . .                                                                                                                             | 150           | —— Improvements still needed, . . . . .                                                                                                                                                          | 15, 16   |
| Assurance Statistics in the German States, Tables of, 152-160, 165-170, 172-179, 180, 182, 183, 191, 192                                                                         |               | —— Districts should be coincident with Registration Districts, . . . . .                                                                                                                         | 46       |
| Assurances existing, discontinued, &c. &c., Table of, . . . . .                                                                                                                  | 195           | Chelmsford and Essex Provident Society, Letter relative to Sickness among the Members of the, 434, 435.— <i>See</i> Essex.                                                                       |          |
| —— Period elapsed from Date of assuring to Death, as shewn by fifteen selected Offices, . . . . .                                                                                | 196           | Cholera, Asiatic, Abstract of Deaths from, as exhibited by the Gotha Office Tables, 169, 170, 187, 188                                                                                           |          |
| —— <i>See</i> Policies.                                                                                                                                                          |               | —— Highest Rate of Mortality from the Disease, . . . . .                                                                                                                                         | 187      |
| Auxiliary Rates and Contributions of Friendly Societies.— <i>See</i> Rates and Contributions.                                                                                    |               | —— Rate of its Ravages in 1832 in Paris, . . . . .                                                                                                                                               | 188      |
| Average Results in Educational Statistics, Necessity for Analysis of, . . . . .                                                                                                  | 372           | —— Comparative Table of Deaths in the Gotha Office, and in Paris and London, . . . . .                                                                                                           | 189      |
| Bakers, Expectation of Life among, . . . . .                                                                                                                                     | 55, 59        | City Districts, List of, 610.— <i>See</i> Towns.                                                                                                                                                 |          |
| —— not so unhealthy as generally supposed, . . . . .                                                                                                                             | 60            | Classes.— <i>See</i> Upper Classes.                                                                                                                                                              |          |
| —— high rate of Mortality, low average of Sickness among, . . . . .                                                                                                              | 411           | Clerks, Expectation of Life among, . . . . .                                                                                                                                                     | 54, 59   |
| Barlow, Mr., of Birmingham, Mr. Neison's Views corroborated by, . . . . .                                                                                                        | 517           | —— Comparatively high Rate of Mortality among, . . . . .                                                                                                                                         | 59       |
| Bassingwhite, Mr., on the Experiences of the Chelmsford and Essex Provident Society, 434. Intenability of his "Jacob's Ladder" Remark, 435.— <i>See</i> Essex Provident Society. |               | —— Difference of Expectation of Life between them and Labourers, . . . . .                                                                                                                       | 60       |
|                                                                                                                                                                                  |               | —— not subject to average amount of Sickness, . . . . .                                                                                                                                          | 411      |
|                                                                                                                                                                                  |               | Clough, Archdeacon, Sickness experience of Society established by, . . . . .                                                                                                                     | 463      |
|                                                                                                                                                                                  |               | Colliers and Miners, causes of frequent appearance of on Sick Lists, 411.— <i>See</i> Miners.                                                                                                    |          |



## COLLISIONS.

|                                                                                                                                       | Page               |
|---------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| Collisions on Railways.— <i>See</i> Railways.                                                                                         |                    |
| Commutation System, facilities of the, in complicated calculations, . . . . .                                                         | 592                |
| Composition in lieu of Annual Subscription, Data for Computation of, . . . . .                                                        | 128, 130           |
| Contributions to Friendly Societies, Miseries resulting from inadequacy of, . . . . .                                                 | 452                |
| ————— <i>See</i> Rates and Contributions.                                                                                             |                    |
| Counties wherein Crime exceeds the Average Ratio, 365, 367                                                                            |                    |
| ————— wherein Crime is below the Average, . . . . .                                                                                   | 366, 368           |
| Crime, importance of age as an element in Inquiries regarding, . . . . .                                                              | 302, 395, 396      |
| ————— Ratio of, to the Population at various Terms of Life; Males, 303, 394; Females, 304.                                            |                    |
| ————— Varying tendency to, at different Periods of Life, . . . . .                                                                    | 305                |
| ————— Amount of, in certain places, in 1842-3-4, assuming the Ratio to be the same as for England and Wales, . . . . .                | 322, 324           |
| ————— Proportion of, to Population in various Districts, . . . . .                                                                    | 325                |
| ————— Various elements necessary for avoiding Error in Inquiries relative to, . . . . .                                               | <i>ibid.</i>       |
| ————— Proportion and Ratio <i>per cent.</i> of, Male and Female, . . . . .                                                            | 326, 327           |
| ————— Suggestions explanatory of Disparity in Amount of, in various Districts, . . . . .                                              | 328                |
| ————— Actual and Calculated Amount of, in 1842-3-4, in each County, . . . . .                                                         | 329-332            |
| ————— Ditto for the Mining and Manufacturing Districts contrasted with the Ratio for England and Wales for the same period, . . . . . | 333                |
| ————— Similar Table for the Agricultural Counties, . . . . .                                                                          | 334                |
| ————— Actual and Calculated Amount of, in 1845-48, in each County, . . . . .                                                          | 335-337            |
| ————— Annual Rate of increase for 1842-4 in England and Wales, . . . . .                                                              | 338                |
| ————— Phenomena exhibited by the foregoing Tables, . . . . .                                                                          | 339                |
| ————— Difference between actual Amount of, in each District, and the Average for England and Wales, . . . . .                         | 340, 341, 344, 345 |
| ————— Aspects of, as exhibited by various Classes of the Population, . . . . .                                                        | 342, 343, 346-352  |

## CRIMINAL.

|                                                                                                                                               | Page                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Crime, Actual and calculated Amount of, at various Periods, in proportion to Signatures by marks in the Marriage Registers, 354, 355, 357-362 |                              |
| ————— Influence of Education on the amount of, . . . . .                                                                                      | 353, 355, 356, 363, 364, 371 |
| ————— Co-existence of, with Poverty, . . . . .                                                                                                | 356                          |
| ————— Counties wherein actual Amount of, exceeds the Average Ratio, . . . . .                                                                 | 365, 367                     |
| ————— Counties below the Average Ratio, . . . . .                                                                                             | 366, 368                     |
| ————— and Ignorance constant Companions, . . . . .                                                                                            | 388                          |
| ————— proportionate tendency to, in the two Sexes, . . . . .                                                                                  | 391                          |
| ————— Law regulating tendency to, at different Ages, not the same in every Class, . . . . .                                                   | 396                          |
| ————— Necessity for a Solution of this Problem, and for refined Analysis before drawing conclusions, . . . . .                                | 397                          |
| ————— Excess <i>per cent.</i> of, in 1842-44 above that in 1834-39, . . . . .                                                                 | <i>ibid.</i>                 |
| ————— positive decrease of, among the Population at younger Ages . . . . .                                                                    | 398                          |
| ————— Recapitulation of Facts and Conclusions deducible from the foregoing Paper . . . . .                                                    | 403-407                      |
| Criminal Offenders in 1842-3-4 in each County of England and Wales . . . . .                                                                  | 315-321                      |
| ————— in 1845-6-7-8 with Ratio of Crime to Population at various terms of Life.—Males, 369; Females, 370.                                     |                              |
| ————— degree of Education among, during eleven years, divided into three periods, 371; Ratio for the the same period, 372.                    |                              |
| ————— degree of Instruction among, in Counties exceeding the Average Ratio, 373; ditto in Counties below the Average, 374-376.                |                              |
| ————— Abstract of results obtained by last mentioned Tables, . . . . .                                                                        | 377, 378                     |
| ————— Educational Condition of, according to Classification in Tables XVIII and XIX (pp. 357-362), . . . . .                                  | 380-383                      |
| ————— Number and Ratio of, according to degrees of Education in the general Community, 384, 385; Difference in favour of Education, 386, 388. |                              |
| ————— relative degree of Instruction among, in each Class of Offences, . . . . .                                                              | 387, 389                     |



## CRIMINAL.

|                                                                                                                                                                                      | Page                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| Criminal Offenders, Age and Sex of total number committed or bailed yearly, 1834-39 . . .                                                                                            | 392, 393                 |
| ————— in England and Wales, 1834-39, in each Class of Offences, . . . . .                                                                                                            | 394                      |
| ————— per centage of, to Population at various terms of life in each Class of Offences, . . . . .                                                                                    | 395                      |
| ————— Valuelessness of Home Office Returns of, in later years, 399; instances of Defects therein, 400.                                                                               |                          |
| ————— Table shewing number of, in each County, in 1849-53, in various Classes of Offences, 401; Abstract of such Table as precise as it can be made from the defective Returns, 402. |                          |
| Criminal Statistics as affected by Data furnished by the Marriage Registers, . . . . .                                                                                               | 353-362                  |
| Data, correctness in, necessary for the prevention of serious error, . . . . .                                                                                                       | 45, 56, 65, 93, 325, 449 |
| ———— want of, respecting Mortality among Abstainers from intoxicating Drinks . . . . .                                                                                               | 218                      |
| ———— of Sickness in Friendly Societies, evils arising from incorrectness in, . . . . .                                                                                               | 444-448                  |
| ———— necessity for caution in the practical application of, . . . . .                                                                                                                | 530                      |
| Deaths.— <i>See</i> Mortality.                                                                                                                                                       |                          |
| Decrements in the Army Medical Officers' Society, Table of, . . . . .                                                                                                                | 119, 120                 |
| ———— in the Royal Medical and Chirurgical Society, ditto, . . . . .                                                                                                                  | 129                      |
| ———— among Master Mariners, ditto, . . . . .                                                                                                                                         | 147, 148                 |
| ———— among Persons of Intemperate Habits, ditto, . . . . .                                                                                                                           | 216                      |
| Deferred Annuities.— <i>See</i> Annuities.                                                                                                                                           |                          |
| Delirium Tremens, Mortality from, in 1847, . . . . .                                                                                                                                 | 223, 224                 |
| Disease, maximum or minimum effect of, on life at certain periods, . . . . .                                                                                                         | 34                       |
| ———— Classification of, from the Gotha Society's Tables, . . . . .                                                                                                                   | 169                      |
| ———— Intensity of, at various Ages, 171; Order of such Intensity, 183.                                                                                                               |                          |
| ———— Results deducible from Gotha Society's Tables of, . . . . .                                                                                                                     | 180-183                  |
| ———— peculiarly fatal to intemperate persons, . . . . .                                                                                                                              | 222                      |

## EQUATION.

|                                                                                                                          | Page                    |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Donations to funds of Friendly Societies, erroneous inferences regarding, . . . . .                                      | 522                     |
| Drinks, intoxicating.— <i>See</i> Intoxicating Drinks.                                                                   |                         |
| Drunkards, proportion of to whole Population, . . . . .                                                                  | 229                     |
| Dundee, expectation of Life in, as compared with Glasgow, . . . . .                                                      | 87                      |
| ———— Population of and Mortality in, during ten specified years, . . . . .                                               | 90                      |
| ———— Mortality Tables for; Male, 91; Female, 92.                                                                         |                         |
| ———— Value of Life in, higher than in Glasgow or Liverpool, . . . . .                                                    | 90, 93                  |
| Dying in one year, Probabilities of, among Friendly Societies, . . . . .                                                 | 477                     |
| Edinburgh Compositors' Society, Excess of Sickness in, as compared with the data whereon its Rates were based, . . . . . | 417-419                 |
| Education, different acceptations of the term, . . . . .                                                                 | 353                     |
| ———— amount of, tested by ability to write, and ratio of, to crime, . . . . .                                            | 354                     |
| ———— degree of Crime accompanying high and low states of, . . . . .                                                      | 355, 363, 364           |
| ———— degree of, among Criminals, in three successive periods, . . . . .                                                  | 371                     |
| ———— Importance of, as a preventive of Crime conclusively evidenced by Criminal Returns, . . . . .                       | 372, 379, 386, 388, 391 |
| "Eliza Cook's Journal," Union of Lodges recommended by, . . . . .                                                        | 518                     |
| Employment, influence of, independent of local causes, . . . . .                                                         | 56, 57                  |
| ———— noxious, effect of, in reducing the value of life, . . . . .                                                        | 58-60                   |
| ———— nature of, an important consideration in the formation of Benefit Societies, . . . . .                              | 416, 427                |
| Equation of life, explanation of the term, . . . . .                                                                     | 100                     |
| ———— compared with expectation of life in different localities and classes, . . . . .                                    | 100, 101                |
| ———— mode of determining same, . . . . .                                                                                 | 101                     |
| ———— among married members of Army Medical Officers' Society, . . . . .                                                  | 121                     |
| ———— among persons of intemperate habits, . . . . .                                                                      | 217                     |
| ———— <i>See</i> Life.                                                                                                    |                         |



## EQUITABLE.

|                                                                                                        | Page     |
|--------------------------------------------------------------------------------------------------------|----------|
| Equitable Life Office, Experience of, compared with other offices, . . . . .                           | 193, 194 |
| Essex Provident Society, Rate of Sickness in, as compared with whole of England and Wales, . . . . .   | 436      |
| ——— Result of Valuation made by Mr. Ansell for the, . . . . .                                          | 438, 439 |
| ——— Sickness among female members of the, . . . . .                                                    | 464      |
| ——— See Chelmsford.                                                                                    |          |
| Exercise, influence of, on Sickness and Mortality among various Trades, . . . . .                      | 456-458  |
| Expectation of Life among rural labourers; decennial Table, . . . . .                                  | 53       |
| ——— among various classes of Workers, . . . . .                                                        | 54, 55   |
| ——— not sufficiently accurate for all purposes, . . . . .                                              | 100      |
| ——— among in-door and out-door occupations, as influenced by little or great exercise . . . . .        | 456-458  |
| ——— according to certain English and Foreign Tables, . . . . .                                         | 607      |
| ——— in Ireland, . . . . .                                                                              | 615      |
| ——— See Life.                                                                                          |          |
| Factory Occupations, Table of Mortality and Sickness among, . . . . .                                  | 454      |
| ——— List of . . . . .                                                                                  | 611      |
| Farr, Mr., Opinion of, relative to increase of Sickness and Mortality in Friendly Societies, . . . . . | 157, 158 |
| Females, tendency to crime among, less than in Males, . . . . .                                        | 305      |
| ——— effect of active and sedentary employment on the health of, . . . . .                              | 462      |
| ——— rate of sickness among, as compared with Males, . . . . .                                          | 463      |
| ——— Sickness among, as shewn by Essex Provident Society's Tables, . . . . .                            | 464      |
| Finlaison, Mr., reference to Report and Tables of, . . . . .                                           | 42       |
| Fluctuations in Mortality in different years, instances of, and cause thereof, . . . . .               | 428, 429 |
| Foresters, Sickness and Mortality in the Order of, . . . . .                                           | 465      |
| ——— Injustice of an uniform Rate of Contribution among, irrespective of Age, . . . . .                 | 530      |
| Formula for correction of Census for 1841, . . . . .                                                   | 1-4      |

## GERMAN.

|                                                                                             | Page                         |
|---------------------------------------------------------------------------------------------|------------------------------|
| Formula for measuring excess of mortality in residue of population, . . . . .               | 44, 45                       |
| ——— for determining Equation of Life, . . . . .                                             | 101                          |
| ——— for determining risks on lives of Master Mariners, . . . . .                            | 148, 149                     |
| ——— for Interpolation of Mortality, . . . . .                                               | 206-217                      |
| ——— for ascertaining rate of mortality among those actually sick, . . . . .                 | 451                          |
| ——— for ascertaining premium for, and value of Deferred Annuities, . . . . .                | 491                          |
| ——— for construction of auxiliary Tables of Rates and Contributions for various purposes.   |                              |
| ——— See Rates,—Auxiliary Tables.                                                            |                              |
| Friendly Societies, general value of male life among Members of, . . . . .                  | 38                           |
| ——— Rate of mortality among female Members of, . . . . .                                    | 65                           |
| ——— influence of locality on Sickness among, . . . . .                                      | 408                          |
| ——— Evils of recent Legislation respecting, . . . . .                                       | 416                          |
| ——— great value of, when based on a proper System, . . . . .                                | <i>ibid.</i>                 |
| ——— difficulty of graduating Scales of Payment for, . . . . .                               | 432                          |
| ——— in Essex, Hitchin and Wilts, Results of Valuation, &c. for, . . . . .                   | 438-440                      |
| ——— Government Returns of Sickness and Mortality among, . . . . .                           | 440                          |
| ——— Per Centage and Ratio of Sickness and Mortality in, . . . . .                           | 450                          |
| ——— ruinous consequences of, reliance upon erroneous data, respecting Sickness, &c. . . . . | 415, 416, 437, 484, 489, 490 |
| ——— Rate of Sickness in various Societies, as compared with each other, . . . . .           | 419                          |
| ——— Reflection on the present financial Condition of, . . . . .                             | 489, 490                     |
| ——— See Odd Fellows. Rates and Contributions. Sickness.                                     |                              |
| German States, number of Persons assured in the, . . . . .                                  | 158                          |
| ——— Period elapsed from date of assuring till death, . . . . .                              | 159, 160                     |



## GERMAN STATES.

|                                                                                                          | Page         |
|----------------------------------------------------------------------------------------------------------|--------------|
| German States; Peculiarities exhibited by the last-mentioned results, . . . . .                          | 160, 161     |
| Glasgow, Population of, for 1831 and 1841, with annual rate of increase, . . . . .                       | 83           |
| ——— Population, deaths, per centage of mortality, &c. in, . . . . .                                      | <i>ibid.</i> |
| ——— Mortality per cent. &c. at various ages in,—Males, 84; Females, 85.                                  |              |
| ——— Equation of life in, as compared with other localities, . . . . .                                    | 86           |
| ——— Expectation of life in, as compared with Dundee, . . . . .                                           | 87           |
| ——— fluctuation in number of deaths in, . . . . .                                                        | 88           |
| ——— value of female life in, as compared with males, . . . . .                                           | 89           |
| ——— Mr. Ratcliffe and Mr. Neison's Notes on Sickness in, compared with other localities, . . . . .       | 427, 431     |
| ——— Fluctuations in the Mortality of, . . . . .                                                          | 428          |
| ——— A.M.C., Remarks on Table of Rates proposed for, . . . . .                                            | 497, 501     |
| Glaziers.— <i>See</i> Plumbers.                                                                          |              |
| Goldsmiths' Friendly Societies, . . . . .                                                                | 419          |
| Gotha Life Assurance Society, extent of the transaction of the, . . . . .                                | 152          |
| ——— various statistics of mortality in the, tabularly arranged, . . . . .                                | 152-157      |
| ——— Mortality among its assurers in each month, . . . . .                                                | 167          |
| ——— Causes of Death at various ages during two decennial periods, . . . . .                              | 169          |
| ——— Ratio of Deaths at various ages, . . . . .                                                           | 170          |
| ——— Deaths from all causes and total duration of life after assurance, . . . . .                         | 172-175      |
| ——— Similar Table, with average duration, . . . . .                                                      | 176-179      |
| ——— average period elapsed from date of assuring to date of death, . . . . .                             | 180          |
| ——— <i>See</i> also pages 187, 189, 190, 191, 193.                                                       |              |
| Government Annuitants, unfavourable rate of Mortality among, . . . . .                                   | 42, 157      |
| Government Annuity Tables, character of the, . . . . .                                                   | 42           |
| Great Western Railway Friendly Society, quinquennial amount of Sickness in the, 447. Table thereof, 448. |              |
| Guy, Dr., on duration of life among the higher Classes, . . . . .                                        | 43           |

## INTEMPERANCE.

|                                                                                                                                                      | Page          |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Guy, Dr., on duration of life in the several Professions, . . . . .                                                                                  | 131           |
| Heriot's Benefit Society . . . . .                                                                                                                   | 419           |
| Highland Society, Tables of Sickness of, as compared with Mr. Ansell's Tables, . . . . .                                                             | 413, 415      |
| ——— same reported of unfavourably by House of Commons Committee, . . . . .                                                                           | 416, 445      |
| ——— Imperfectness of its data as tested by the experience of other Societies, &c. . . . .                                                            | 417-420       |
| Hitchin Friendly Society, Result of Valuation of liabilities and assets of the, . . . . .                                                            | 439           |
| Home Office, Number of Criminals and their degrees of Instruction as shewn by Returns of, . . . . .                                                  | 377, 378      |
| ——— Results deducible therefrom, . . . . .                                                                                                           | 379           |
| ——— Tabular Analysis of the educational condition of Criminals classified according to nature of Offences, and result deducible therefrom, . . . . . | 387, 388      |
| ——— Abstracts of the above-mentioned Returns, . . . . .                                                                                              | 389, 390      |
| ——— defective State of recent Criminal Returns of the, since 1839, and evils resulting therefrom, . . . . .                                          | 395, 399, 400 |
| Hopf, Mr., Actuary of Gotha Life Assurance Society, Table of facts deduced from a Paper by, . . . . .                                                | 197           |
| Infants, uniform rate of mortality among, . . . . .                                                                                                  | 428           |
| Intemperance, importance of the subject of, to Life Assurance Societies, . . . . .                                                                   | 201           |
| ——— Circular addressed by the Author for information relative to, . . . . .                                                                          | <i>ibid.</i>  |
| ——— Plan for obtaining, and Schedule for registering Results of Inquiries, . . . . .                                                                 | 202           |
| ——— difficulty of establishing a standard of, and changes in habits of society, relative to, . . . . .                                               | 202, 203      |
| ——— Mortality among Persons addicted to: Table, 203; Abstract, 204.                                                                                  |               |
| ——— melancholy results deducible therefrom . . . . .                                                                                                 | 204, 205      |
| ——— Formulæ adopted for obtaining the required results, . . . . .                                                                                    | 205-217       |



## INTEMPERANCE.

|                                                                                                                             | Page                  |
|-----------------------------------------------------------------------------------------------------------------------------|-----------------------|
| Intemperance; chances of Life among Intemperate Persons as compared with general Population, . . .                          | 217                   |
| ——— value of Papers referring to the subject, by Mr. Balfour and Colonel Sykes, . . .                                       | 218                   |
| ——— Increase of intemperate habits with advancing age, . . . . .                                                            | 225                   |
| ——— <i>See</i> Delirium Tremens. Drunkards.                                                                                 |                       |
| Interest on money, influence of Rate of, on Tables of Mortality, . . . . .                                                  | 482, 483              |
| ——— Compound, as affecting calculations for benefits conferred by Friendly Societies, . . .                                 | 521                   |
| Interpolation, method employed in calculating Tables of, . . . . .                                                          | 117-120, 145, 212-215 |
| Intoxicating Drinks, per centage of Mortality resulting from indulgence in various kinds of, . . .                          | 218                   |
| Ireland, proportion of crime to mud hovels in, . . .                                                                        | 322                   |
| ——— Expectation of Life in, . . . . .                                                                                       | 615                   |
| Juvenile Delinquency, suggestive remarks upon, . .                                                                          | 342                   |
| ——— <i>See</i> Crime.                                                                                                       |                       |
| Kent, Male Mortality, and causes of Death in, . . .                                                                         | 184, 185              |
| Labourers in rural Districts, Intensity of Life, and per centage of Mortality among . . . . .                               | 47, 53                |
| ——— Expectation of Life among, as compared with various specified employments, . . . . .                                    | 54, 56                |
| Leeds Provident Society, Ratio of Sickness in the, as compared with the Liverpool Society, . . . . .                        | 437                   |
| Life, age at which highest specific intensity of, is attained, . . . . .                                                    | 7                     |
| ——— duration of, in the two Sexes at various periods, . . . . .                                                             | <i>ibid.</i>          |
| ——— Annual Expectation of, from the age of ten, . . .                                                                       | 8                     |
| ——— comparative value of in the two Sexes, calculated decennially . . . . .                                                 | 9, 10                 |
| ——— Insufficiency of Data for calculating influence of locality on duration of, and suggestions relative thereto, . . . . . | 10-15                 |
| ——— duration of, as shewn by Returns from Scotland, and plan adopted to obtain required information, . . . . .              | 17-19, 28             |
| ——— Tables exhibiting some of the Results, . . . . .                                                                        | 20-27, 29-32          |
| ——— Results of the Comparison of the Scotch Tables with those of England and Wales, . . . . .                               | 28, 33-35             |

## LIFE.

|                                                                                                                             | Page                      |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Life, Comparative value of, in rural and town districts, . . . . .                                                          | 37                        |
| ——— Superior value of, among Members of Friendly Societies, . . . . .                                                       | 38-43                     |
| ——— Greater value of, in assured lives than in Government Annuityants, . . . . .                                            | 42                        |
| ——— Inferior value of, among the higher Ranks, . . .                                                                        | 43, 467                   |
| ——— Standard of, not elevated by middle or upper Classes, . . . . .                                                         | <i>ibid.</i>              |
| ——— Effect of various employments on duration of, . . .                                                                     | 46                        |
| ——— Tables relative to last-mentioned subject, . . . . .                                                                    | 47-52, 54, 55, 59, 61, 62 |
| ——— Explanation of Tables relative to duration, &c. of, in Scotland, . . . . .                                              | 67                        |
| ——— Expectation of, in Scottish compared with English Friendly Societies, . . . . .                                         | 76                        |
| ——— Specific intensity of &c., in Scotland: Rural, Town, and City Districts, . . . . .                                      | 77-80                     |
| ——— Expectation of, in Scotland, . . . . .                                                                                  | 81                        |
| ——— Specific intensity of &c., in Glasgow, . . . . .                                                                        | 84, 85                    |
| ——— Equation of, for age ten in England and Wales, as compared with Glasgow, . . . . .                                      | 86                        |
| ——— Expectation of, in Glasgow and Dundee, . . . . .                                                                        | 87                        |
| ——— Expectation of, in Glasgow, between the two Sexes, . . . . .                                                            | 89                        |
| ——— Equation of, in Dundee. Males, 91; Females, 92.                                                                         |                           |
| ——— Ditto, in Glasgow, Liverpool and Dundee, . . . . .                                                                      | 93                        |
| ——— Expectation and Equation of; Analysis of the two terms; Tabular examples thereof; mode of calculating same, &c. . . . . | 99-101                    |
| ——— Appalling waste of, from habitual indulgence in intoxicating drinks, . . . . .                                          | 205                       |
| ——— <i>See</i> Intemperance.                                                                                                |                           |
| ——— Term of, at which tendency to crime is greatest, . . .                                                                  | 303, 304                  |
| ——— <i>See</i> Crime.                                                                                                       |                           |
| ——— Ratio constantly Sick at various terms of, . . . . .                                                                    | 466                       |
| ——— Evil effects of sanitary irregularities on duration of, much overstated, . . . . .                                      | 467                       |
| ——— more immediate causes of such evils, and direction in which remedies are to be sought, . . .                            | 468                       |
| ——— Expectations of, in rural and city districts, with reference to value of Annuities, . . . . .                           | 482                       |
| Life Assurance.— <i>See</i> Assurance.                                                                                      |                           |



## LIVERPOOL.

|                                                                                                              | Page                       |
|--------------------------------------------------------------------------------------------------------------|----------------------------|
| Liverpool, Expectation of Life in: Tables and remarks relative to, . . . . .                                 | 40, 60, 63, 64, 76, 86, 93 |
| ——— Per centage of Mortality at various ages in, . . . . .                                                   | 89                         |
| ——— Sickness Experience of, compared with Glasgow, . . . . .                                                 | 427, 431                   |
| Liverpool Friendly Society, ratio of Sickness in the, as compared with the Leeds Society, . . . . .          | 437                        |
| Lodges of Odd Fellows, Manchester Unity, number of, . . . . .                                                | 514                        |
| ——— Evils resulting from fewness of members in each, &c. . . . .                                             | <i>ibid.</i>               |
| ——— Union of, recommended, . . . . .                                                                         | 518                        |
| Maclaren, Mr., result of a Medical Inquiry conducted by, . . . . .                                           | 462                        |
| Manchester Unity.— <i>See</i> Odd Fellows.                                                                   |                            |
| Manufacturing and Mining Districts, how divided for classifying Statistics of Crime, . . . . .               | 328                        |
| ——— Table shewing Amount of Crime in the . . . . .                                                           | 333                        |
| ——— Varying per centage of, and stimulus to Crime in the, . . . . .                                          | 339                        |
| ——— Difference between Amount of Crime in the, and average for England and Wales, . . . . .                  | 340, 344                   |
| ——— Excess of Crime in the, over the average for the whole country, . . . . .                                | 343                        |
| ——— -- Criminal Statistics of the, as compared with agricultural districts, . . . . .                        | 346-352                    |
| ——— Amount of Crime in the, in proportion to signatures by marks, . . . . .                                  | 357-362                    |
| Mariners' Friendly Societies, Mortality Statistics furnished by, . . . . .                                   | 150                        |
| ——— <i>See</i> Master Mariners.                                                                              |                            |
| Marks, signatures by.— <i>See</i> Crime. Marriage Registers.                                                 |                            |
| Marriage Registers, value of educational tests afforded by, with reference to Criminal Statistics, . . . . . | 353                        |
| ——— Ratio of signatures, by marks in, to amount of Crime, . . . . .                                          | 354-362                    |
| Master Mariners' Society, plan and objects of the, . . . . .                                                 | 134                        |
| ——— Mortality, from all causes, among the members of the, . . . . .                                          | 136, 137                   |
| ——— Mortality from natural causes in the, . . . . .                                                          | 138, 139                   |
| ——— Mortality from accidental causes in the, . . . . .                                                       | 140, 141                   |

## MORTALITY.

|                                                                                                        | Page       |
|--------------------------------------------------------------------------------------------------------|------------|
| Master Mariners, Mortality in the, as compared with that of the whole country, . . . . .               | 142        |
| ——— Risk of wrecks among the members, . . . . .                                                        | 143, 144   |
| ——— Effect of age and experience, in reducing liability of the members to risks, . . . . .             | 144        |
| ——— Interpolation Tables of Mortality, &c. . . . .                                                     | 145-148    |
| ——— Table relative to values of Annuities, &c. on lives of, . . . . .                                  | 149        |
| Medical attendance on Friendly Societies, suggestions relative to, . . . . .                           | 453        |
| Medical Chirurgical Society, progress of the, . . . . .                                                | 121, 126   |
| ——— Tabular and Chronological Views of its vicissitudes, . . . . .                                     | 122-124    |
| ——— Rate of mortality among its members, . . . . .                                                     | 125        |
| ——— Duration and decrement of membership in the, . . . . .                                             | 127, 129   |
| ——— Suggestions relative to compositions in lieu of annual subscriptions, . . . . .                    | 128, 130   |
| ——— Mortality among the members, compared with male population, . . . . .                              | 130        |
| ——— Results of Dr. Guy and Professor Casper's inquiries upon this subject, . . . . .                   | 131        |
| Medical Department, Army.— <i>See</i> Army.                                                            |            |
| Metropolis, male mortality of the, . . . . .                                                           | 128        |
| ——— Ditto, compared with various localities, . . . . .                                                 | 187        |
| Miners, Expectations of Life among, . . . . .                                                          | 55, 59, 60 |
| Mold, Sickness Experience of Female Society at, . . . . .                                              | 463        |
| Mortality in England and Wales, best record of, . . . . .                                              | 1, 16      |
| ——— Total number of deaths and per centage of mortality for 1838-41, . . . . .                         | 4          |
| ——— Annual number of deaths per 100,000, mortality per cent. and specific intensity thereof, . . . . . | 5, 6       |
| ——— Difficulties in the way of determining difference of, in various districts, . . . . .              | 10, 11     |
| ——— Suggestions for removing such difficulties, . . . . .                                              | 13-15      |
| ——— high rate of, in Scotch Cities, . . . . .                                                          | 76         |
| ——— various tabular returns of, from Scotland, . . . . .                                               | 77-80      |
| ——— Statistics of, for Glasgow, . . . . .                                                              | 83-85, 88  |
| ——— Per centage of, at various ages, in Liverpool, . . . . .                                           | 89         |
| ——— Statistics of, for Dundee, . . . . .                                                               | 90-92      |
| ——— varying ratios of sickness, &c. in rural, town, and city districts, . . . . .                      | 410, 411   |



| MORTALITY.                                                                                                                                                                              | Page         | ODD FELLOWS.                                                                                                                                  | Page         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Mortality, necessity for development of law of, in order to arrive at safe conclusion, . . . .                                                                                          | 420          | Odd Fellows, Amount of sickness experienced by members at certain ages, classified according to their occupations, . . . . .                  | 426          |
| ——— fluctuations of, in connection with Lodges having few members, . . . . .                                                                                                            | 520          | ——— Necessity for caution in acting on data furnished by the Unity's present experience, . . . . .                                            | 427          |
| Mortality among various classes.— <i>See</i> Army; Friendly Societies; German States; Gotha Life Office; Intemperance; Master Mariners; Medical Chirurgical Society; Provident Classes. |              | ——— Objections to adoption of an uniform scale for the Unity, . . . . .                                                                       | 432          |
| Munro, Mr., result of Returns procured from Recha-bite Societies by, . . . . .                                                                                                          | 218          | ——— Injustice of an uniform rate of contribution irrespective of age, . . . . .<br>492, 493, 511–513, 528, 529                                |              |
| Northampton Tables, comparison of with other Tables, . . . . .                                                                                                                          | 433          | ——— Per centage of mortality in the Unity, as compared with the whole population, &c. and results deducible therefrom, . . . . .              | 493, 494     |
| Occupations, amount of sickness in Manchester Unity, classified according to, . . . . .                                                                                                 | 426          | ——— Value of an Annuity of £1, calculated from the actual experience of the Order, . . . . .                                                  | 495          |
| ——— effect of, in production of disease, . . . . .                                                                                                                                      | 427, 454     | ——— Premiums for Assurance of £1 payable at death, and payments necessary for £1 a-week during sickness, calculated from same data, . . . . . | 496          |
| ——— Sickness and Mortality among various: viz.,                                                                                                                                         |              | ——— Total number of members, of weeks' sickness, and amount paid to sick members in 1844, . . . . .                                           | 497          |
| Factory occupations, . . . . .                                                                                                                                                          | 454          | ——— Benefits guaranteed by the Unity, and weekly payments deemed sufficient to ensure same, . . . . .                                         | <i>ibid.</i> |
| In-door, requiring little exercise, . . . . .                                                                                                                                           | 455          | ——— Inadequacy of these rates, and consequent perilous condition of the Unity, . . . . .                                                      | 498, 499     |
| In-door, requiring great exercise, . . . . .                                                                                                                                            | 456          | ——— Immediate necessity for placing the Unity on a safer foundation, and suggestions towards that end, . . . . .                              | 499–501, 505 |
| Out-door, requiring little exercise, . . . . .                                                                                                                                          | 457          | ——— Income and Expenditure of the Unity in 1844, . . . . .                                                                                    | 501, 502     |
| Out-door, requiring great exercise, . . . . .                                                                                                                                           | 458          | ——— Ruinous consequences of a continuance of the present system of management and expenditure, and analysis thereof, . . . . .                | 502–506      |
| Female, active and sedentary, . . . . .                                                                                                                                                 | 462          | ——— Rate of payment for various districts necessary to ensure the proposed benefits, and observations thereon, . . . . .                      | 507–510      |
| ——— Expectation of life in in-door and out-door, with little or great exercise, . . . . .                                                                                               | 456          | ——— Danger attendant on small societies in the Unity, . . . . .                                                                               | 520          |
| ——— Sum of rate of sickness per annum in same classes of, at quinquennial terms of life, . . . . .                                                                                      | 458          | ——— Plan whereby an uniform scale would become advantageous to the Unity, . . . . .                                                           | 525          |
| ——— <i>See</i> Trades.                                                                                                                                                                  |              | ——— Moral responsibilities of the officers of the Unity, . . . . .                                                                            | 526          |
| Odd Fellows, Manchester Unity of, character of the, Sickness Statistics of the, . . . . .                                                                                               | 421          |                                                                                                                                               |              |
| ——— Analysis of the Mortality and Sickness Returns of the, for 1844, . . . . .                                                                                                          | 422          |                                                                                                                                               |              |
| ——— Results of Parliamentary Investigations, as bearing on the question, . . . . .                                                                                                      | 423          |                                                                                                                                               |              |
| ——— Coincidence of later proceedings of the Unity, with suggestions made by the Author, . . . . .                                                                                       | <i>ibid.</i> |                                                                                                                                               |              |
| ——— Mr. Ratcliffe's Report on Sickness experienced by the Unity in 1846–8, and results deducible therefrom, . . . . .                                                                   | 423–425      |                                                                                                                                               |              |
| ——— Effect of influx of young members, and other disturbing causes . . . . .                                                                                                            | 425, 426     |                                                                                                                                               |              |



## ODD FELLOWS.

|                                                                                                                               | Page         |
|-------------------------------------------------------------------------------------------------------------------------------|--------------|
| Odd Fellows, Manchester Unity of, Urgent need for, and suggestions for hastening a reform in the management of the, . . . . . | 527-527      |
| ——— Number of Members of Parliament, Clergymen, &c. in the Unity, and special services whereof they are capable, . . . .      | 529          |
| ——— See Blackburn; Friendly Societies; Glasgow; Lodges; Preston.                                                              |              |
| Offences and Offenders, Criminal.—See Crime; Criminal Offenders.                                                              |              |
| Painters.—See Plumbers.                                                                                                       |              |
| Paris, rate of mortality from cholera in, in 1832, . . . . .                                                                  | 188          |
| Peerage, expectation of life in the, . . . . .                                                                                | 40           |
| ——— less than in other classes of the community, . . . . .                                                                    | 43, 151, 157 |
| Phillips, Mr., reference to Treatise on Scrofula, by, . . . . .                                                               | 454, 455     |
| Plumbers, Painters, and Glaziers, rate of mortality, &c., among, at various ages, . . . . .                                   | 49           |
| ——— Expectation of Life among, . . . . .                                                                                      | 59           |
| ——— Amount of sickness among, compared with other trades, . . . . .                                                           | 426          |
| ——— Unhealthy incidents of their occupation irremovable, . . . . .                                                            | 468          |
| Police Force, Metropolitan, Object of Statistical Society's Committee's Report on, . . . . .                                  | 459          |
| ——— Number, age at joining, &c. of the . . . . .                                                                              | <i>ibid.</i> |
| ——— average daily mileage, and nightly duties of each man, . . . . .                                                          | 459, 461     |
| ——— number of weeks' sickness in each division during eight years, . . . . .                                                  | 460          |
| ——— fluctuations of sickness among the, and irksome and laborious nature of their duties, . . . . .                           | 461          |
| Policies of Assurance, lapsed, subsisting, effected, &c. in the Gotha Life Assurance, . . . . .                               | 154, 191     |
| ——— Average period from date of, to death of the assured, . . . . .                                                           | 165          |
| ——— Ratio of discontinuance of, &c. in Gotha, Equitable, and fifteen other offices, . . . .                                   | 193          |
| ——— "existing" and "discontinued"; deaths, ratio of premiums, &c. . . . .                                                     | 195          |
| ——— discontinued, large profits arising from, . . . . .                                                                       | 196          |
| ——— See Assurance.                                                                                                            |              |

## RAILWAYS.

|                                                                                                         | Page          |
|---------------------------------------------------------------------------------------------------------|---------------|
| Population of England and Wales, 1821-41, with annual rate of increase, . . . . .                       | 2             |
| ——— Total, as calculated for 31st Dec. 1838-39-40, and 30th June, 1841, . . . . .                       | 4             |
| ——— Number per 100,000 left alive annually, from age of ten, . . . . .                                  | 5, 6          |
| ——— Ratio of, to criminal offenders, 1842-1844, . . . . .                                               | 303, 304      |
| ——— in 1841, in each county at quinquennial ages—males, . . . . .                                       | 306, 307      |
| ——— ditto—females, . . . . .                                                                            | 308, 309      |
| ——— ditto, with proportionate number at each term of life—males, . . . . .                              | 310, 314      |
| ——— Summary of, males and females, . . . .                                                              | 314           |
| ——— Difference of distribution of, in altering apparent ratio of crime, . . . . .                       | 314, 321, 325 |
| ——— Yearly ratio of criminals to, and number committing one crime, in each class of offences, . . . . . | 395           |
| ——— See Census.                                                                                         |               |
| Poverty and distress, co-existence of crime with, . . . . .                                             | 356           |
| Premiums for benefits in Friendly Societies.—See Rates.                                                 |               |
| Preston District Sick Union, average amount of sickness in each Lodge of the, . . . . .                 | 515           |
| ——— importance of example furnished by the . . . . .                                                    | 516           |
| ——— Report of Board of Management of, . . . .                                                           | 516-519       |
| Price, Dr., Hypothesis of Sickness of, . . . . .                                                        | 433           |
| Printers, rate of mortality, &c. among at various ages . . . . .                                        | 49            |
| ——— See Compositors.                                                                                    |               |
| Property, Statistics of Offences against, . . . .                                                       | 394, 396, 398 |
| Providence Lodge, Manchester, fallacious nature of the Sickness Statistics of, . . . . .                | 513           |
| Provident classes, mortality of the, . . . . .                                                          | 151           |
| ——— expectation of life among various grades of, . . . . .                                              | 158           |
| ——— See Friendly Societies; Odd Fellows.                                                                |               |
| Railways, important bearing of, on Vital Statistics, . . . . .                                          | 230           |
| ——— Number of miles open, and periodical increase of, from 1840 to 1852, . . . . .                      | 231           |
| ——— Number of miles open and in progress in the United States, . . . . .                                | <i>ibid.</i>  |



## RAILWAYS.

|                                                                                                                           | <i>Page</i>                          |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| Railways, Traffic Returns of; Passengers, Fares, Receipts, 1840-52, . . . . .                                             | 232                                  |
| ——— Ratio of increase of passengers by, over increase of mileage, . . . . .                                               | 233                                  |
| ——— Remarkable increase in per centage of passengers by and receipts from Parliamentary trains, . . . . .                 | 233, 234                             |
| ——— Average fares per mile in pence, 1840-52, and results deducible therefrom, . . . . .                                  | 234                                  |
| ——— Difference of fares in England, Scotland, and Ireland, . . . . .                                                      | 235                                  |
| ——— Beneficial result of introduction of Parliamentary trains, . . . . .                                                  | <i>ibid.</i>                         |
| ——— Total mileage of, and average distance travelled by passengers, in each class, . . . . .                              | 236, 237                             |
| ——— Phenomena exhibited by the gradual development of cheap fares, . . . . .                                              | 237, 238                             |
| Railway Accidents:                                                                                                        |                                      |
| ——— Variety of views respecting, and partial nature of remedies suggested for prevention of, . . . . .                    | 239                                  |
| ——— Mode of proceeding requisite for conducting inquiries relative to, . . . . .                                          | 239, 240                             |
| ——— Classified Tables of deaths and injuries from various causes, and among various classes, from 1840 to 1852, . . . . . | 241, 244                             |
| ——— Condensed summary of results deduced from above Tables, . . . . .                                                     | 245                                  |
| ——— Total number of each class killed and injured annually, 1840-52, . . . . .                                            | 246                                  |
| ——— Gradual diminution of accidents to passengers, as distinguished from other classes of sufferers, . . . . .            | 247, 290                             |
| ——— Complete Tabular Classification of causes of accidents and classes killed or injured, 1840-52, . . . . .              | 248-255                              |
| ——— Curious results presented by analysis of last-mentioned Tables, . . . . .                                             | 256                                  |
| ——— Ratio of mortality per cent. from each cause to that from all causes among each class of sufferers, . . . . .         | 257                                  |
| ——— Proportion of, within and beyond the control of the Companies, . . . . .                                              | 258-260, 262, 263, 290-293, 296, 297 |

## RATES.

|                                                                                                          | <i>Page</i>                                        |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Railway Accidents, Gradual reduction in frequency and intensity of, . . . . .                            | 260                                                |
| ——— Proportion of, due to the culpable neglect of railway servants, . . . . .                            | 264                                                |
| ——— Runnings off the rails, and analysis of causes thereof, . . . . .                                    | 273-275, 300, 301                                  |
| ——— Deaths and injuries resulting from last-mentioned cause, . . . . .                                   | 276, 277                                           |
| ——— Various classes exposed to risk, numbers killed and injured, ratio of killed to injured, &c. . . . . | 286-289                                            |
| Railway Collisions, ratio of at different periods, 261, 262, 268                                         |                                                    |
| ——— Analysis of causes of, from 1844 to 1852                                                             | 263-265                                            |
| ——— Number of deaths and injuries due to each cause of, during same period, . . . . .                    | 266                                                |
| ——— Yearly number of deaths, &c. resulting therefrom, and observations thereon, 1844-52                  | 267, 268                                           |
| ——— Comparative Table of, occurring to various trains, and results deducible therefrom . . . . .         | 269, 270                                           |
| ——— Monthly classification of, 1844-52, and of deaths and injuries therefrom, . . . . .                  | 271                                                |
| ——— Various localities of, 1844-52, and number killed or injured thereby, . . . . .                      | 272                                                |
| ——— Accidents by, compared with accidents from "running off the line," . . . . .                         | 278                                                |
| ——— Deaths among employes from . . . . .                                                                 | 295, 298, 299                                      |
| Railway Employes killed and injured, statistics relative thereto, . . . . .                              | 242-246, 251-255, 257, 271, 272, 276, 277, 282-301 |
| ——— Number engaged on lines open for traffic in Great Britain and Ireland . . . . .                      | 279                                                |
| ——— Number and description of, exposed to risk, . . . . .                                                | 280, 281                                           |
| Ratcliffe, Mr., on sickness and mortality in Manchester Unity of Odd Fellows, . . . . .                  | 423, 424, 426, 427, 431, 432                       |
| ——— Inadequacy of data used by him for his Monetary Tables, . . . . .                                    | 425, 492                                           |
| Rates and Contributions of Friendly Societies:                                                           |                                                    |
| ——— Precautions to be observed in calculation of, . . . . .                                              | 469, 482, 483                                      |
| ——— Tables of immediate, deferred and temporary annuities—males, . . . . .                               | 470, 471, 472                                      |



## RATES.

## Page

## SANITARY.

## Page

|                                                                                                                                                              |               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Rates and Contributions of Friendly Societies :                                                                                                              |               |
| ——— Premiums, single, annual, and temporary,<br>for sums at death—males, . . . . .                                                                           | 473, 474, 475 |
| ——— Premiums, single and annual, for sick<br>allowances, . . . . .                                                                                           | 478, 479, 480 |
| ——— Value of annuities, premiums for sums at<br>death, on whole population, . . . . .                                                                        | 481           |
| ——— Serious consequences of calculating on<br>erroneous data, . . . . .                                                                                      | 484           |
| ——— Difference in values of annuities, and<br>amounts of premiums, according to various<br>authorities, . . . . .                                            | 485           |
| ——— Formulæ whereon Sickness Allowance<br>Table on p. 478 is based, . . . . .                                                                                | 485, 486      |
| ——— Different elements affecting calculations<br>for annuities and sickness allowances, . . . . .                                                            | 487, 488      |
| ——— Comparative values of sick allowance of<br>£1 per week, according to various autho-<br>rities, . . . . .                                                 | 488, 489      |
| ——— Dangers resulting from inadequate contri-<br>butions, . . . . .                                                                                          | 489-492       |
| ——— Necessity for graduation of contributions<br>according to, and injustice of equal rates<br>irrespective of age, . . . . .                                | 492, 513      |
| ——— Tables and formulæ for determining value<br>of sickness allowances, &c. . . . .                                                                          | 493, 494      |
| ——— Value of annuity, premiums for sickness<br>allowance, &c., calculated from actual expe-<br>rience of Manchester Unity Order of Odd<br>Fellows, . . . . . | 495, 496      |
| ——— Insufficiency of contributions of the Order<br>for benefits promised, and amount actually<br>required, . . . . .                                         | 498, 507-512  |
| <i>Auxiliary Tables</i> :—Formulæ employed for con-<br>struction of, 531-533, 544-549, 574-577, 595-597,<br>600-602, 604-606                                 |               |
| ——— Tables for single lives—males, cal-<br>culated on whole population, at from 3 to<br>10 per cent. . . . .                                                 | 534-543       |
| ——— Tables for joint lives—males, whole<br>population, calculated at 7 per cent. . . . .                                                                     | 550-574       |
| ——— Logarithm of present value of £1, at<br>from 3 to 10 per cent. at end of any number<br>of years, . . . . .                                               | 578-581       |

|                                                                                                                  |                                                                 |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <i>Auxiliary Tables</i> for Friendly Societies, three<br>districts, at from 3 to 5 per cent. . . . .             | 582-591                                                         |
| ——— Examples, differences between values,<br>&c., arrived at by the Tables, . . . . .                            | 592, 593                                                        |
| ——— Tables Calculated on a disparity of<br>50 years, . . . . .                                                   | 603                                                             |
| ——— See Annuities; Friendly Societies; Odd<br>Fellows.                                                           |                                                                 |
| Rechabite Temperance Societies, unfavourable na-<br>ture of Mortality Returns furnished by, . . . . .            | 218                                                             |
| ——— Scale of payments to benefit funds of, . . . . .                                                             | 529                                                             |
| ——— Inadequacy and injustice of such scale, . . . . .                                                            | 530                                                             |
| Registrar-General, value of the Reports of the, . . . . .                                                        | 1                                                               |
| ——— Consequences of want of unity between<br>his districts and those of the Census Commis-<br>sioners, . . . . . | 10                                                              |
| ——— His letter to the Author, and suggestions<br>of the latter relative thereto, . . . . .                       | 12-15                                                           |
| ——— Inaccuracy of his Reports, relative to<br>deaths from intemperance, . . . . .                                | 255                                                             |
| Registration, Statistical Society's Report on, and<br>improved forms recommended therein, . . . . .              | 94-99                                                           |
| Rural Districts, amount of sickness and mortality in,<br>20, 21, 487                                             |                                                                 |
| ——— Number living, dying, per centage of mor-<br>tality, &c., in . . . . .                                       | 29                                                              |
| ——— Similar Table, for labourers only, . . . . .                                                                 | 47, 53                                                          |
| ——— Distinction between value of life among<br>various classes in, . . . . .                                     | 56, 57                                                          |
| ——— Influence of occupations on duration of<br>life in, . . . . .                                                | 58, 59                                                          |
| ——— Approximation of results in, in England<br>and Scotland, . . . . .                                           | 82                                                              |
| ——— of Scotland.—See Scotland.                                                                                   |                                                                 |
| Rural, Town, and City Districts combined—Tables,<br>comparison of results, &c., . . . . .                        | 26, 27, 32-38, 44, 45,<br>48-51, 53-55, 57, 59-63, 409-411, 422 |
| Sanders, Mr., of Birmingham, an advocate for large<br>societies . . . . .                                        | 518                                                             |
| Sanitary condition of localities, disastrous effects of,<br>much overrated, . . . . .                            | 467                                                             |
| ——— Regulations, true merits of the question<br>regarding, . . . . .                                             | 468                                                             |



## SCOTLAND.

## Page

- Scotland, plan adopted for obtaining correct Returns from Friendly Societies in, . . . . . 17-19
- Explanation of Tables of Duration of Life in, . . . . . 67
- Tables of deaths, sickness, duration and expectation of life, &c., in, at various ages and periods; Rural Districts, 68, 69, 77. Towns, 70, 71, 78. Cities, 72, 73, 79. Rural Town and City Districts combined, 74, 75, 80, 81, 160, 161.—*See* Sickness.
- High rate of mortality in city districts of, . . . . . 76
- Improved registration system of, and beneficial results anticipated therefrom, . . . . . 93
- Statistical Society's Report on Registration Bill for, . . . . . 94-99
- Amount of mortality and sickness in, compared with England, . . . . . 412
- Distinction made in Sickness Returns of some Societies in, . . . . .
- Parallelism of rate of sickness in English rural districts and whole of Scotland, and smaller value of Scottish sick allowance, . . . . . 487
- List of districts in, . . . . . 611
- *See* Aberdeen; Dundee; Edinburgh; Glasgow; Highland Society.
- Scrofula, reference to Mr. Phillips's Treatise on, . . . . . 453-455
- Seasons, state of the weather, &c., influence of, on rates of Mortality and Sickness, . . . . . 168, 461
- number of collisions on railways as affected by, . . . . . 263, 266, 270
- Sex, precautions to be observed regarding, in Criminal Inquiries, &c. . . . . 325
- *See* Age and Sex.
- Shipwrecks, Table of Risks of, . . . . . 143
- *See* Mariners.
- Sickness in various districts, among various classes, occupations, trades, &c., . . . . . 20-27, 68-75, 454-462
- Per centage, Ratio of, &c. in Scottish Friendly Societies, . . . . . 160
- ending in recovery, number of weeks' duration of, . . . . . 161
- ending in death, similar Table, . . . . . 162
- Average duration of each attack of, with final results, . . . . . 163, 164

## SICKNESS.

## Page

- Sickness, Phenomena of, not sufficiently taken into Account by Life Assurance Offices, . . . . . 163
- Terms of life at which most or least protracted, . . . . . *ibid.*
- Average amount of, per annum to each person, expressed in weeks, . . . . . 409, 410
- Amount of, in inverse Ratio to that of Mortality in certain Trades, . . . . . 411
- Different Ratios of, in Scotland and England, . . . . . 412
- Annual amount of, in weeks, deduced from various authorities, . . . . . 413
- Qualified value of those authorities, and larger actual amount of Sickness as compared therewith, . . . . . 414, 415
- Delusiveness of schemes for provision against, based on inadequate data, . . . . . 415-417
- Comparison of experience of various Societies, with such data, . . . . . 417-421, 433
- Amount of, to each member of the Manchester Unity, . . . . . 422
- Quinquennial periods of, according to data of this Work, and of Odd Fellows respectively, 424, 426
- Amount of, in certain trades at certain Periods of life, . . . . . 426
- Folly of relying on limited observations regarding, . . . . . 429
- Actual experience and expected amount of, in certain Societies, . . . . . 429-432
- Ratio of, to each person in certain Societies, and results deducible therefrom, . . . . . 437, 438
- Quinquennial Statistics of, according to Government Returns, . . . . . 440
- Average quinquennial ratio of, derived from same and other sources, . . . . . 441
- Mistaken views of the subject of, in Parliamentary Papers, and dangers likely to result therefrom, . . . . . 442, 445
- Ratio of protracted Sickness and "walking about" Sickness to total amount of, . . . . . 446, 447
- Protracted and permanent, necessity for special provision for, . . . . . 449
- Per centage of sick, and Ratio per cent. of sick to non-sick members, &c. . . . . 450



| SICKNESS.                                                                                                                                                                                                                                                      | Page                                 | YEATS.                                                                                                | Page         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------------------------------------------------------------------------------------------|--------------|
| Sickness; Explanation of, and observations on results obtained by last-mentioned Table, . . .                                                                                                                                                                  | 449, 421-453                         | Towns and Cities, Sanitary condition of, not the main cause of high or low mortality therein, . . .   | 64, 457, 467 |
| — in England and Wales, according to certain data, expressed in weeks, . . .                                                                                                                                                                                   | 463                                  | — Cause of the short duration of life among certain classes of workers in, . . .                      | 468          |
| — Ratio constantly sick at various terms of life, . . .                                                                                                                                                                                                        | 466                                  | — See "Rural, Town, and City Districts combined."                                                     |              |
| — Erroneous views of Sanitary Reformers in connection with subject of, . . .                                                                                                                                                                                   | 467, 468                             | Trades not classified, number living and dying, mortality per cent. &c. of, . . .                     | 61, 62       |
| — Elements affecting calculations for provisions against, . . .                                                                                                                                                                                                | 487, 488                             | — not classified, Scotland, sickness and mortality of, . . .                                          | 68-75        |
| — Comparative values of allowances for, for various ages and districts, . . .                                                                                                                                                                                  | 488, 489                             | — noxious and sedentary, influence of, on duration of life, . . .                                     | 468          |
| — Fallacious conclusions on the subject, and corrective remarks thereon, . . .                                                                                                                                                                                 | 521, 522                             | — out-door and in-door, lists of, . . .                                                               | 612-614      |
| — Distressing consequences of arbitrary reduction of allowances in case of continued Sickness, and remedial suggestions, . . .                                                                                                                                 | 522, 523                             | — See Bakers, Butchers, Plumbers, Occupations.                                                        |              |
| — Advantage of deferred annuities in lieu of sick allowances after age of seventy, . . .                                                                                                                                                                       | 524                                  | Trades' Benefit Societies, Scotland, excess of sickness among, over Highland Societies' Tables, . . . | 419          |
| — See Friendly Societies. Odd Fellows. Rates.                                                                                                                                                                                                                  |                                      | United States of America, rapid extension of Railways in the, . . .                                   | 231          |
| Sopwith, Mr., success of Society under superintendence of, . . .                                                                                                                                                                                               | 594                                  | Upper Classes not so long lived as the humbler classes, . . .                                         | 467          |
| Sotherton, Mr. objects of Committee obtained in House of Commons by, 423; drift of the witnesses examined by his Committee, <i>ibid.</i> ; Highland Society's Tables condemned by it, 445; beneficial Legislative Results of his public spirited efforts, 527. |                                      | — See Guy. Peerage.                                                                                   |              |
| Tailors, inverse proportion of Mortality and Sickness among, . . .                                                                                                                                                                                             | 411                                  | Violence, deaths from, at home and abroad, deduced from various data . . .                            | 189          |
| Thistle and Rose Society, Glasgow, Sickness and Mortality experience of the, compared with other societies, &c. . .                                                                                                                                            | 430-433                              | — Statistics of Crime with and without, 388, 394, 396                                                 |              |
| — duration of various classes of sickness, in the . . .                                                                                                                                                                                                        | 448                                  | Vital Statistics, novel features connected with, . . .                                                | 452          |
| Thomson, Mr., cases wherein the Actuarial Tables of, are serviceable, . . .                                                                                                                                                                                    | 594                                  | — See Life. Expectation and Equation of Life.                                                         |              |
| Time, influence of, in producing average results, . . .                                                                                                                                                                                                        | 428                                  | Watkins, Mr. William, Statistics of Sickness furnished by, . . .                                      | 465          |
| Town Districts, list of, . . .                                                                                                                                                                                                                                 | 610                                  | Watt, Dr., of Glasgow, comparative Statistics of Sickness furnished by, . . .                         | 433          |
| Towns and Cities, Tables of mortality, sickness, duration of life, &c., in, . . .                                                                                                                                                                              | 22-25, 30, 31, 37, 70, 70-73, 78, 79 | Wealth, prevalence of, in certain districts, considered in relation to amount of Crime therein, . . . | 353, 359     |
| — Average mortality of, lowered by certain employments practised therein, . . .                                                                                                                                                                                | 60                                   | Wiltshire Provident Society, Rate of Sickness in, . . .                                               | 437          |
|                                                                                                                                                                                                                                                                |                                      | — Liabilities and Assets of the, . . .                                                                | 439          |
|                                                                                                                                                                                                                                                                |                                      | — Cause of its Prospects, . . .                                                                       | 440          |
|                                                                                                                                                                                                                                                                |                                      | Writing considered as an educational test, . . .                                                      | 353          |
|                                                                                                                                                                                                                                                                |                                      | — Connection of inability to write with amount of Crime, . . .                                        | 354-362      |
|                                                                                                                                                                                                                                                                |                                      | Yeats, Mr., Sickness Statistics furnished by, . . .                                                   | 429          |

LONDON:

PRINTED BY T. BRETTELL, RUPERT STREET, HAYMARKET.











Neison, F. G. P.

Contributions to Vital Statistics: being, a Development of the Rate of Mortality and the Laws of Sickness, from original and extensive Data: with an Inquiry into the Influence of Locality, Occupations, and Habits of Life on Health; an analytical View of Railway Accidents; and Investigation into

London 1857

4 Brit. 85 km

urn:nbn:de:bvb:12-bsb10225322-0